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ABSTRACT

Eighteen papers were presented at the conference by practitioners, academic researchers, labor representatives and members of government. Summaries of papers are grouped under the headings: Apprenticeship as a Training Process; Lessons from Followup Studies of Journeymen and Apprentices; Minorities in Apprenticeship; Apprenticeship Training in Reference to Manpower Planning; and Lessons from Foreign Experience and Apprenticeship. Complete texts of three papers are included: "Alternative Approaches to Improving Apprenticeship Effectiveness," by George Strauss; "A Trade Union Perspective on Apprenticeship Research," by Reese Hammond; and "A Computerized Labor Market Information System and Its Place in the Construction Industry," by Edwin A. Markowitz and D. Quinn Mills. It was concluded that apprenticeship is basically healthy, and that the guiding principles for a future oriented model apprenticeship system are: (1) voluntarism, (2) flexibility, (3) a wide range of occupations, and (4) quality and quantity. Specific conclusions and recommendations were categorized: (1) cost and financing, (2) ways and means to improve quality of training, (3) apprenticeship and minorities, and (4) data requirements for developing model training systems. (MW)

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REPORT OF A CONFERENCE ON APPRENTICESHIP TRAINING

and

SUGGESTIONS FOR A MODEL APPRENTICESHIP SYSTEM FOR THE 1970'S

Sponsored by the Office of Research
and Development, U.S. Department of Labor
May 30 - June 1, 1973

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Foreward

The United States Department of Labor has actively supported research on numerous aspects of apprenticeship training since the early 1960's. In June 1973 the department sponsored a conference at which some of the country's foremost scholars presented and discussed their findings. This publication is based on: (1) papers presented at the conference, (2) intensive discussions provoked by the papers, and (3) post-conference discussions with persons who are currently responsible for conducting apprenticeship training. We trust that we have properly distilled the essence of the research findings in those instances where, because of the constraints of publication, we had to summarize several man-years of research in three or four pages. The complete text of three of the papers is reproduced in this volume either because they were already too concise to be cut or because their unity needed to be retained. Other papers are summarized - we hope not unfairly.

The material in the Conference report was prepared under Grant No. 21-36-73-39 from the Manpower Administration, U.S. Department of Labor, under the authority of Title I of the Manpower Development and Training Act of 1962, as amended. Since grantees undertaking such projects under government sponsorship are encouraged to express freely their professional judgement this document does not necessarily represent the official position or policy of the Department of Labor. The grantee is solely responsible for the contents of this report.

I would like to convey my appreication to the conference participants, the U.S. Department of Labor staff, particularly to Mr. Howard Rosen, Director of the office of Research and Development, and Mrs. Francine Herman, reporter, for their contributions to a significant endeavor. My thanks go to all of them.

Felician F. Foltman
Conference Director

PREFACE

In February, 1946, the Congress of the United States, in a rare show of bipartisan support, declared it a matter of public policy to "...use all practicable means...to coordinate and utilize all its plans, functions and resources for the purpose of creating and maintaining...conditions under which there will be afforded useful employment opportunities...for those able, willing and seeking to work, and to promote maximum employment...". Employment could not be left solely to the vagaries of the market, according to the Employment Act of 1946. Sixteen years later Congress spelled out even more precisely its concern for employment when it created the Manpower Development and Training Act. These two laws express, more than any others, our conviction that qualified people can be matched with employment demands, providing government makes specific plans and takes appropriate action.

The route of this ambitious mandate has been uneven, at best, and frequently tortuous; yet substantial progress has been made toward the stated goal. And perhaps nowhere has the undertaking been more effective than in the area of apprenticeship training, in which, thanks to the persistence of the Office of Research and Development of the Manpower Administration, systematic research efforts have been funded continuously over the past decade. Products of this research effort may prove to be, in the long run, the most important consequences of our public manpower policy. Without organized research we will continue to make the same errors; we will continue to remain ignorant of program effectiveness.

Why has the Manpower Administration focused so sharply on apprenticeship? The rationale may be stated briefly as follows:

1. The apprenticeship system is an important source of supply of highly skilled workers.

2. Those who complete apprenticeship training frequently are promoted to key supervisory and leadership roles.

3. The apprenticeship system has become a symbol of denied employment opportunities to minority groups who resent their inability to get training for the better paying blue collar jobs.

4. The comprehensive approach to training that characterizes the apprenticeship system affords government, industry and labor an opportunity to apply what is learned about improving apprenticeship training to other training paths.

Unlike most research efforts, those undertaken by the Office of Research and Development of the Manpower Administration incorporate a conceptual and incremental framework, making it possible to verify propositions,

to build on previous knowledge, and to develop the kinds of comprehensive guidelines for policy and administrative change summarized in this volume. The key areas in the R & D framework, as originally set forth in the early 1960's were: preapprenticeship; the selection process; administration and financing of apprenticeship; the training process itself; and, continuous training. With minor modifications, this design is still being pursued.

In the Fall of 1971, the Office of Research and Development convened a two-day conference of its funded researchers who were actively conducting investigations in one or another area of apprenticeship. The purpose of the conference was twofold: to make researchers aware of the total R & D program, and its conceptual/incremental design; and to hear and discuss preliminary research findings. The success of this early conference led to the decision to sponsor another, more comprehensive, gathering when the research efforts were completed. Accordingly, a second conference was called in Washington, DC in June, 1973.

The 1973 conference was designated not only to provide a forum for reviewing research results but also planned to elicit policy implications for improving the apprenticeship system. And instead of relying exclusively on research findings produced by academicians, the organizers of the conference also invited knowledgeable administrators and officials closely associated with apprenticeship to discuss the merits of proposed programmatic changes. The plan further called for interviewing key figures in apprenticeship training throughout the nation in order to stimulate feedback and refine recommendations.

In addition and in what can only be described as serendipitous circumstances, a separate but complementary program on upgrading apprenticeship training was being initiated by the Secretary of Labor at about the same time. Labeled "New Initiatives in Apprenticeship," this effort began with a Task Force convened in the Department of Labor to find ways to improve and expand apprenticeship. Fortunately, Professor Foltman, who planned and conducted the research conference, was also invited to participate in the deliberations of the special Task Force, thus providing him with an ideal opportunity to discuss research findings with responsible decision makers. It was also fortuitous that the Task Force, composed primarily of federal, state, labor and management officials, devoted its analysis primarily to managerial and organizational concerns.

For the most part suggestions included in this report for improving our apprenticeship system were derived from research programs. In some instances, however, the recommendations have been modified, or entirely new changes proposed, as the result of Task Force discussions, thus meeting simultaneously the tests of validity and of practicability.

Summary and Recommendations

This conference project was planned to be executed in three phases: In phase I those researchers who had studied the apprenticeship training system under the auspices of the Office of Research and Development of the United States Department of Labor, were brought together to review their

findings and to discuss implications for policy and other changes; phase II was devoted to analyses and feedback by reviewing research findings against criteria such as practicality, feasibility and acceptability. And in phase III the focus is on wide distribution of this report to those persons who have an official responsibility or role in apprenticeship training.

Selected Highlights and Outcomes

Eighteen papers were presented at the conference by practitioners, academic researchers, representatives of labor, and members of government, all relating in one way or another to fundamental aspects of apprenticeship and skill training. Distilled from the conference and from post conference analysis are the following highlights:

- Although small in numbers apprenticeship training prepares the core of our skilled work force.
- Apprenticeship is a flexible dynamic and adaptable training system quite capable of relating to present day and future needs; it should be expanded.
- As with any human endeavor it is possible and desirable to improve the system.
- Instruction can be improved, especially by developing performance based individualized training.
- Continued experimentation with public subsidies and/or technical help are highly desirable to determine optimum levels and approaches of support by government.
- Related instruction can and should be provided in a variety of ways and in all manner of institutions from colleges to high schools to private schools.
- Continuous rigorous enforcement of anti-discrimination laws must be a high priority.
- More attention should be devoted to upgrading journeymen.
- Government must assume an active role in developing viable labor market information systems to undergird more and better manpower planning, particularly in the construction industry.
- Much still remains to be done before we can say that we have solved the problems of recruiting, training and retraining minorities in skilled occupations.
- There are important lessons to be learned from apprenticeship training practices in other countries.

A Diagnosis of Apprenticeship Training

As already implied in the above highlights it is a major conclusion of this project that apprenticeship is basically healthy, but that some changes are required to maintain a healthy state, or to make it even more vigorous and productive. Another important implication from this project is that the guiding principles for a model apprenticeship system that is effectively future oriented are:

(1) Voluntarism with some government support and guidance particularly support of a technical nature (employers, unions, and other interested parties

are encouraged to develop training programs appropriate for their needs and circumstances), (2) flexibility, especially when defining standards or in their implementation, (3) applying the training system to a wide range of occupations and industries, and (4) an emphasis on both quality and quantity.

Recommendations for Action

Specific conclusions and recommendations were grouped in the following categories: (1) costs and financing, (2) ways and means to improved quality of training, (3) apprenticeship and minorities, and (4) data requirements for developing model training systems. These recommendations are:

1) Costs and Financing

Recommendations

Expand the use of Apprenticeship Trust Funds
Develop practical schemes for providing tax credits or other forms of subsidy to apprenticeship sponsors
Provide more financial support for pre-apprenticeship training
Increase the amount of financial support for outreach and journeymen retraining
Expand amount of subsidy for related instruction
Budget more Federal dollars for sound administration

2) Ways and Means for Improving Quality of Training

Recommendations

Training content and sequence of on-the-job training and related instruction should be based on an analysis of required performance
Incorporate more tests and examinations with the training process
All apprentices should continue to be required to complete a specified amount of related instruction but implementation of this standard should be based on flexible and modern training technologies
More and better supervision of the training is required
More and better data are required
Technical assistance and research must be expanded

3) Apprenticeship and Minorities

Recommendations

Outreach staffs and the Office of Federal Contract Compliance and other responsible government bodies should continue to expand apprenticeship opportunities for minorities.
High priority should be given to research relating to minorities in apprenticeship.

4) Data Requirements for Developing Model Training Systems

Recommendations

Experiments to computerize local labor market information systems in

the construction industry should be financed and supported by the Federal government.

The Bureau of Labor Statistics effort to develop an efficient system for collecting information about training systems should be strongly supported.

Participants - Papers

(Presented in the order in which they appear in this publication.)

Participants	Conference Role - Title of Papers
Felician F. Foltman, NYSSILR, Cornell University	Conference Director
Howard Rosen, Director, Office of Research & Development, U.S. Department of Labor	Sponsor
Francine Herman, Cornell University	Reporter
*George Strauss, University of California at Berkeley	"Alternative Approaches to Improving Apprenticeship Effectiveness"
Arthur Oriel, Development Systems Corporation, Chicago	"Development of a Performance Based Individualized System for Technical and Apprentice Training"
Steven Swanson, Morris Horowitz, Irwin Herrnstadt, Northeastern University	"Related Instruction: Is it Related?"
Gerald Somers, University of Wisconsin	"The Feasibility of Establishing Demonstration Centers for Apprenticeship and Other Industrial Training"
Howard Foster, State University of New York at Buffalo	"Training in the Home Building Industry"
*Reese Hammond, Research and Education Director, International Union of Operating Engineers	"A Trade Union Perspective on Apprenticeship Research"
C. A. Pearce, Director of Research, New York State Department of Labor	"A Follow-Up Survey of Apprenticeship Completers and Dropouts in New York State 1958-1969"

Participants	Conference Role - Title of Papers
Thomas A. Barocci, NYSSILR, Cornell University	"Summary and Policy Implications of a Survey of Former Apprentices in Wisconsin"
Carl Schramm, Johns Hopkins University	"Occupational Mobility and Rates of Return Connected with Apprenticeship Training"
Ray Marshall, William S. Franklin, Robert W. Glover, University of Texas	"Formal and Informal Training of Selected Construction Craftsmen"
Dennis Derryck, Brandeis University	"Retention of Minorities in Apprenticeship: The Nature of the Issue"
Ernest Green, Recruitment and Training Programs, New York	"R.T.P. - A Model for Apprenticeship Training"
Napoleon B. Johnson II, National Urban League	"Research Issues and Problems in the Apprenticeship System"
Stephen A. Schneider, Herbert R. Northrup, University of Pennsylvania	"Minority Improvement in Apprenticeship Participation in Construction Trades"
Richard Rowan, University of Pennsylvania	"Alternative Routes to Skill: Voluntary Programs in the Construction Industry"
Charles Nye, Division of Apprenticeship & Training, Wisconsin	"Women in Apprenticeship - A Research Project"
Neil Rosenthal, Bureau of Labor Statistics, Washington, DC	"Report on a Pilot Survey of Training in Industry"
*Edwin A. Markowitz and D. Quinn Mills, Massachusetts Institute of Technology	"A Computerized Labor Market Information System and Its Place in the Construction Industry
Myron Roomkin, University of Chicago	"Lessons from Europe"

*Indicates complete text of paper reproduced here

Completed Research Reports and Titles on Which Papers Were Based

1. Northeastern University (Swanson, Horowitz, Herrnstadt): The Role of Related Instruction in Apprenticeship Training; DOL Contract 82-25-71-21; NTIS number not yet available

2. University of Wisconsin (Somers): The Feasibility of Establishing a Demonstration Center for Apprenticeship and Other Industrial Training; DOL Contract 82-55-71-31; NTIS-PB 213555

3. State University of New York (Foster): The Development and Utilization of Manpower Resources in the Homebuilding Industry: A Local Survey of Contemporary Practices; DOL Grant 91-36-71-41; NTIS-PB 212200

4. University of Wisconsin (Barocci): The Dropout and the Wisconsin Apprenticeship Program: A descriptive and Econometric Analysis; DOL Grant 91-55-72-03; NTIS-PB 210935

5. University of Texas (Marshall, Franklin, Glover): A Comparison of Construction Workers Who Have Achieved Journeyman Status Through Apprenticeship and other Means; DOL Contract 82-48-71-28; NTIS number not yet available

6. Brandeis University (Derryck): Improving the Retention Rate of Indentured Apprentices Placed by Apprenticeship Outreach Programs; DOL Contract 82-25-71-36; NTIS-PB 221245

7. State of Wisconsin (Nye): Women in Wisconsin Apprenticeship--Why Not?; DOL Grant 92-53-70-17; NTIS-PB 227727/AS

8. MIT (Markowitz, Mills): Feasibility Study of a Computer-Based Manpower Information System for the Construction Industry; DOL Contract 71-25-71-01; NTIS-PB 214104

9. University of Chicago (Roomkin): Improving Apprenticeship: A Pilot Study of Employer and Union Reactions to Foreign Training Practices; DOL Contract 82-17-71-40; NTIS-PB 222830

10. University of Pennsylvania (Schneider, Northrup, Rowan): Opening the Skilled Construction Trades to Blacks: A Study of the Washington and Indianapolis Plans for Minority Employment; DOL Contract 82-42-71-26; NTIS-PB 213282

Ongoing Research Reports and Titles
on Which Papers Were Based

1. Development Systems Corporation (Oriel): A Performance Based Individualized Training System for Technical and Apprentice Training; DOL Contract 82-17-71-48;

2. IUOE (Hammond): Dual Enrollment as an Operating Engineer's Apprentice and an Associate of Science in Engineering; DOL Grant 21-11-73-12

3. MIT (Markowitz, Mills): Experimental Implementation of a Computer-Based Labor Market Information System for the Construction Industry; DOL Contract 71-25-72-06

Copies of the entire set of papers that were prepared for the Conference on Research in Apprenticeship Training as well as the individual research reports listed above can be purchased from a federal information storage and retrieval system by writing to:

U.S. Department of Commerce
NTIS - National Technical Information Service
5828 Port Royal Road
Springfield, VA 22151

Set of Conference - Research in Apprenticeship Papers _____

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Send remittance with order directly to NTIS and specify the accession number (AD or PB plus a 6-digit number) given in the listing.

INTRODUCTION

Felician F. Foltman

To separate the known from the unknown, scientists often ask for a report on the "state of the art." Similarly, public policy makers look to "position papers" or "white papers" to separate the wheat from the chaff. Summarized here is the state of the art of the apprenticeship as determined by a decade of systematic research. But this report is more than a description of the status quo. Description, per se, while useful to the academician or researcher, is inadequate for reform or policy change. Since constructive change of apprenticeship is our undisguised aim, included here are not only summaries of what we know but also specific recommendations for changes in policy and in practice.

Why Apprenticeship Is on the Public Agenda

Reform of apprenticeship may not be a burning issue when contrasted with our ecological, energy, social and economic concerns; yet it is closely intertwined with several of our current problems. Consider, for example, the inflation of building costs and the high construction wage settlements of the late 1960's. Whether justified or not, many persons laid the blame for those extraordinary wage settlements on the power of unions in this industry to keep the skilled work force from expanding by regulating the number of apprentices. With hindsight, it is now commonly accepted that the charge was untrue, but it did focus on apprenticeship.

Another well-documented reason for public interest in apprenticeship is the powerful drive for equality of opportunity on the part of minorities. It has been said that if minorities were not properly represented among the ranks of skilled craftsmen, then something must have been amiss in apprenticeship training which is the route to these jobs. As a consequence, beginning in the early 1960's, apprenticeship moved to the front pages of the daily press and received more attention by public policy makers.

During the past fifteen years government economists have also become increasingly concerned about the supply of and demand for manpower. Although not always right in their predictions, they have alerted the public to the need for better training processes as one effective way to achieve our productivity goals. And, of course, it was natural to focus on apprenticeship when future skilled manpower needs were being projected.

Whatever the motivation, apprenticeship has been undergoing extensive scrutiny by reformers and researchers. Our purpose is to encourage the reappraisal by presenting validated suggestions for constructive change. To better appreciate both what we have learned and what remains to be done, let us next review some of the myths and misconceptions that exist about apprenticeship.

Apprenticeship Myths

Any human activity as old as apprenticeship, which has been traced back to man's earliest civilized periods, is bound to be encrusted with mystique and

myth, particularly when such activity takes so many different forms, under so many different conditions and arrangements. Many commonly held views about apprenticeship practice are simply myths, often containing a grain of truth, but often completely false. Here are some illustrations of this conventional but obsolete wisdom.

Myth 1: The length of the apprenticeship term (4 years in most cases) is unnecessarily long. Or as it is frequently stated by critics, "it doesn't really require four years to train a plumber."

Reality: Perhaps not, but this criticism overlooks some facts such as: not all apprentices require a full term since many receive credit for previous experience and training; it really does take time for apprentices to be exposed to the great variety of problems, conditions, situations and skills of their occupation in real job settings; and so on.

Myth 2: Females are unqualified for or uninterested in apprenticeship.

Reality: Simply not true.

Myth 3: Apprenticeship programs are confined to the construction and manufacturing industries.

Reality: Although most of the U.S. apprenticeship programs are conducted in these two industries there is no theoretical or practical reason why such training cannot be used in all employment sectors. Proof of wider applications abounds in European experience.

Myth 4: All craftsmen learn their skills through apprenticeship programs.

Reality: This is almost true in some occupations, such as construction electricians, but quite untrue in many other cases. Skills can be acquired in many different ways, although that does not mean that apprenticeship training is ineffective or inefficient. In fact, research indicates that most "key" craftsmen have completed apprenticeship.

Myth 5: Apprenticeship is primarily a device for controlling numbers of skilled craftsmen in a given area, rather than a training process.

Reality: A half-truth at best.

Myth 6: Apprenticeship standards and practices are uniform throughout the country.

Reality: Not at all, since they are agreed to voluntarily and since our public policy is hortatory, not mandatory.

Myth 7: Since skilled workers, particularly in the construction industry, work more with their hands than with their brains, it doesn't

really make any difference whether applicants for apprenticeship training have had much formal academic background education.

Reality: Although some apprenticeship training programs admit candidates who have not completed high school, all programs require literacy and at least average intelligence. And some programs (for e.g. electrician, tool and diemaker) require mathematics and science abilities equal to those required for admission to many colleges.

Can these misconceptions be removed? The answer is yes--no matter what the informational gap--by disseminating verified facts.

What is Apprenticeship and Who Sponsors It? A Birdseye Perspective

Apprenticeship is many things, depending on its context. Paradoxically simple in concept, consisting of organized on-the-job learning experiences combined with related theoretical instruction it is also very complex in that there are countless variations on this basic theme. Apprenticeship in construction, for example, is significantly different from apprenticeship in manufacturing and it is essential that we discuss apprenticeship with reference to particular industries and locales rather than as onemonolithic system of training. Indeed, to complicate matters, it is not only a training system but also a process by which craft unions attempt to regulate the supply of craftsmen in a labor market. For many years craft unions by bargaining or by legislation, have tried to specify how many apprentices should be hired in proportion to journeymen; similarly they have attempted to define the length, content, and administration of the apprenticeship term. Although research has raised many questions about the effectiveness of apprenticeship as a regulator of skilled manpower supply, there are many who are still unaware of the reality. Nevertheless, apprenticeship can and does serve as an instrument for planning manpower at the local labor market level.

To this point we have seen that apprenticeship is a training process and a regulator of labor supply. Additionally, it is and has been a very visible target for those who argue that past nepotistic and discriminatory practices prevented many minorities from entering the ranks of skilled occupations. Because apprenticeship is such an ancient institution, some of its features are thought of as immutable. And, finally, since apprentices are employed persons, the terms and conditions of their employment are subject to collective bargaining, and become, in turn, matters for official governmental concern.

Of some 270,000 apprentices who were officially registered in 1973, some 160,000, or 60 percent, are calculated by U.S. Department of Labor officials to be in the construction industry. The remainder are enrolled in the printing industry, manufacturing, and the services sector. In addition, an unknown number of apprentices are in programs that are not registered officially with any government agency.

Apprenticeship is an issue in collective bargaining; a process for regulating labor supply; a target because of past exclusionary and discriminating practices; a matter for public concern in that skilled craftsmen represent a vital part of our total work force, and, a system for training and employment of young persons

(typically over 21 years of age upon entrance) for at least two years (this is the minimum apprenticeship term as set by U.S. standards, although the State of California permits a one year term), during which they are exposed to a specified number and variety of work processes and conditions on the job; provision for related classroom instruction of at least 144 hours per year (typically offered after working hours in public or private educational institutions); wage rates usually beginning at 50 percent of the journeyman rate and adjusted upwards by stated amounts throughout the apprenticeship term and; some supervision of public officials. The Bureau of Apprenticeship and Training (Federal) and State Apprenticeship Councils bear some responsibility for registration of programs and supervision of on-the-job training while public education is normally assigned responsibility for providing related classroom instruction. In contrast to the European experience, American apprenticeship is not tightly controlled by specific legislation or by detailed administrative regulations, nor does it terminate with a compulsory final examination, except in relatively few instances. Apprenticeship in the United States has been, and continues to be, largely a voluntary arrangement entered into by labor and management, or management alone, with individual learners who are called apprentices.

Who are the sponsors? Who finances? Part of the answer has already been elaborated. Much of the initiative for organizing and conducting apprenticeship programs comes from craft unions which have been actively involved in the effort for many years. Indeed, their interest is so strong that they would probably continue to conduct apprenticeship programs even if all public support were withdrawn. Industrial unions, on the other hand, often bargain about the scope and nature of apprenticeship, but it is not a critical issue for them when a majority of their members are untrained and unskilled production workers. Commonly, employers in manufacturing have assumed the initiative for training a pool of skilled craftsmen while the industrial union entered into the process after the fact to advocate equity, appropriate wage levels, admission criteria and the like.

Employers, are, of course, an indispensable link in this chain of events because employment must be provided for on-the-job learning to occur. The system involves both unionized and non-unionized employers but the latter often fail to see that it is in their interest to train skilled craftsmen either for their own work force or as additions to the available pool; this appears to be the case, for example, in some facets of the building trades. At the operational level, particularly in unionized industries, joint labor-management apprenticeship councils (JAC's or JATC's) are created for the purpose of selecting apprentices and supervising their training. Nowadays, and most frequently in the building trades, the work of the councils is supported by training funds that have been set aside by provisions in collective bargaining agreements.

Sponsorship is intimately tied to financing. Thus it is important to understand who pays and who benefits in this process. Where money for a training fund is provided by the collective bargaining agreement, employers must make specified contributions, usually a percentage or specific amount for every manhour worked. It could be argued, of course, that this is not simply a contribution by the employer since a union may have to forego some wage increases in order to establish such training funds. Unorganized employers usually pay for all the direct costs of training. Both organized and unorganized employers benefit from

public monies that are provided for some of the related classroom instruction. In the majority of cases public schools receive some financial aid to help pay for such instructional costs. Clearly, however, the public investment in apprenticeship training is not sufficient to cover total costs.

Individual apprentices also pay some of the costs by buying books or materials or pay tuition, and by taking related instruction on their own time after work hours. In general, employers claim that they assume most of the financial burden, aided perhaps by public funds for some of the related instruction, and supported by large investments of time, energy and at least indirectly, money, from trade unionists. This brief excursion into financing would not be complete without some mention of the fact that apprenticeship training is not simply a cost as in the case of most training. Although there is a shortage of definite data, most observers now agree that most apprentices earn more with their production than they cost, particularly in the second half of their apprenticeship term. Perhaps this is a good place to reemphasize the point that apprenticeship differs considerably by industry and by state. Wisconsin is a case in point: by State law in Wisconsin apprentices must attend related instruction classes in public schools and employers must pay apprentices their wages while in school. In that case it would appear to be more difficult, to claim high apprentice earnings in light of this extra wage burden.

The 1973 Working Conference on Apprenticeship

From the time man was a simple "hewer of wood and drawer of water," the concept of apprenticeship training has been accepted as the most satisfactory method for ensuring a steady supply of competent artisans to meet the needs of the marketplace. At first, responsibility for training fell to members of the family unit, with skills handed on from father to son. Later, as the quest for consistently high standards found expression in organization, craft guilds assumed the training function and set rigorous criteria for recruitment, training and testing before granting entry to journeyman status. A form of the guild system, with emphasis on caliber of workmanship, persisted in Europe and America until the processes of mass production; it was then that quality gave way to quantity as the measurement of proficiency. As a result, the apprenticeship system--thorough and continuous instruction of new workers to carry on the traditions of a given craft--declined markedly, particularly in the United States.

In the 1950's, however, as domestic consumers railed at the absence of "quality workmanship," as the international market grew in competitiveness, and as technology soared to new heights, apprenticeship took on a new urgency in our society. In the 1960's, a broader dimension was added as apprenticeship became the instrument by which minorities could enter occupations formerly closed to them. Now, in the 1970's, the Secretary of Labor places the need for a revitalized apprenticeship system at the top of his Department's priority list, reflecting the "growing national concern in the development and maintenance of a skilled labor force."[1]

1/ Report of Task Force on New Initiatives in Apprenticeship, Manpower Administration, U.S. Department of Labor, Washington, DC, August 3, 1973, "Introduction." (duplicated)

This, then, is the compelling atmosphere in which a "Working Conference on Apprenticeship Research and Development" was convened in Washington, DC May 30 to June 1, 1973.

Filling the Information Gap

The long range incremental research program of the Office of Research and Development of the U.S. Department of Labor has produced verified facts which rebut many apprenticeship myths. These studies, as summarized in the following pages, illuminate facts such as: apprenticeship is only one of the many paths for acquiring skills for the craftsman levels; related instruction is often unavailable or not well suited to the needs of the apprentice; the instruction in these programs could be more effective; there is wide variation in the conduct of programs. One fact above all has surfaced from these research studies--apprenticeship is an extremely flexible training system capable of adapting to a great variety of circumstances. It can be improved, however, as we acquire more knowledge of how the system operates.

Eighteen papers were presented at the conference by practitioners, academic researchers, representatives of labor, and members of government, all dealing with fundamental problems in apprenticeship and skill training in the United States. These findings represent ten years of imaginative and intensive research effort--an effort quite unique in the annals of social science research. Together they constitute a wide and useful data base from which one can draw implications for policy change as well as more precise questions for further research. Summaries of papers are grouped in this volume under the following headings: Apprenticeship as a Training Process; Lessons from Follow-up Studies of Journeymen and Apprentices; Minorities in Apprenticeship; Apprenticeship Training in Reference to Manpower Planning; and Lessons from Foreign Experience and Apprenticeship.

As this summary will show, comprehensive guidelines were developed at the conference for use by government officials, union leaders, industrialists, and other members of the business community, educators and the public.

CHAPTER I

APPRENTICESHIP AS A TRAINING PROCESS

What is the present state of apprenticeship training in the United States? What are its strengths? Its weaknesses? How can we improve the system? These are the questions investigated in this section of the Conference Report.

George Strauss' overview, the complete text of which is presented here, describes the dynamic, grass-roots character of apprenticeship training, while urging modest expectations of its performance. Although Strauss limits his observations to the construction industry, his recommendations concerning funding, standards of instruction, and the role of government in encouraging expanded training, are universally applicable.

Arthur Oriel reports on a pilot study using task-oriented self-pacing instructional methods, with performance as the sole criterion for successful completion of the course.

Steven Swanson, Morris A. Horowitz and Irwin Herrnstadt examine the related instruction components in two apprenticeship training programs and critique their relevance to job performance.

Objective evaluation of innovations and experiments in apprenticeship and skill training, and sharing the results on a nationwide basis, are the concern of Gerald Somers' paper, as he makes a strong case for government supported demonstration centers.

An area of the construction industry in which there has been a paucity of research is the non-unionized homebuilding sector. Howard Foster breaks new ground here, as he looks at the training activities in this fast-growing field.

The final paper in this chapter prepared by Reese Hammond is presented in toto. His report is less the result of specific research, although the International Union of Operating Engineers is constantly experimenting and innovating with training programs, and more a friendly but critical assessment of academic research on apprenticeship.

ALTERNATIVE APPROACHES TO IMPROVING APPRENTICESHIP EFFECTIVENESS

George Strauss

The purpose of this paper is to contrast the appropriateness of a number of alternative approaches designed to improve the effectiveness of apprenticeship programs in this country. My vantage point is that of observations during a Ford Foundation sponsored study of apprenticeship during the mid-1960's;* however, my objective here is to deal with policy alternatives, not research findings. I will confine my discussion to the building trades because it is here that a majority of apprenticeship occurs.

Some Background

Let me start with some general propositions based on my own research and the research of others.

1. In theory, apprenticeship is the principal port of entry into the crafts. In fact, only a minority of apprentices receive full apprenticeship training. A majority have picked up their skills informally, often in nonunion, rural, or industrial jobs, and they are directly admitted to the union (through the "back door") without formal apprenticeship. Indeed, the function of apprenticeship today seems largely to be that of training skilled keymen, and the proportion of job entrants provided by each trade's apprenticeship program seems to be related to the skill mix that trade requires.** Employers in most trades seem to have adjusted to the use of a substantial proportion of semi-skilled men.

2. What factors determine the relatively low (by some standards) number of apprentices in construction? Not lack of applicants: the skilled trades may have lost some of their popularity as a source of jobs for youth, but in most trades the number of qualified applicants for apprenticeship normally exceeds the number of job openings. Unions do control

*The main publications arising from this study are: George Strauss, "Apprenticeship: An Evaluation of the Need," in Arthur M. Ross, ed., Employment Policy and the Labor Market (Berkeley: University of California Press, 1965), pp. 299-332; George Strauss and Sidney Ingerman, "Public Policy and Discrimination in Apprenticeship," Hasting Law Journal, Vol. 16, No. 3 (February, 1965), pp. 285-331; George Strauss, "Apprentice-Related Instruction: Some Basic Issues," Journal of Human Resources, Vol. 3, No. 2 (Spring, 1968), pp. 213-236; George Strauss and Sidney Ingerman, "Vocational Education for Negro Youth," in Louis Ferman, Joyce Kornbluh, and J. A. Miller, eds., Negroes and Jobs (Ann Arbor: University of Michigan Press, 1968); George Strauss, "Minorities and Apprenticeship," in Neil Chamberlain, ed., Business and the Cities (New York: Basic Books, 1970), pp. 121-127; and George Strauss, "Union Policies Toward the Admission of Apprentices," in Stanley M. Jacks, ed., Issues in Labor Policy (Cambridge, Mass.: MIT Press, 1971), pp. 72-108.

**This seems to be as true in the metal trades as the building trades.

the number who enter, but their restrictions are based largely on their own estimates of market demand. Union estimates are often too cautious, so union control tends to be overtight.* Fundamentally, however, the size of apprenticeship programs is determined by the level of employer demand. The level of employer demand is low because employers often find it cheaper to hire a man someone else has trained than do their own training. In effect, the cost of training is borne by the individual employer, but the benefits are shared by the trade as a whole.

3. Ever since the 1890's, economists have written about apprenticeship as if it were in the process of rapid decay.** Whatever the situation in the past, apprenticeship seems clearly on the upswing today. In absolute numbers registered apprenticeship is close to an all-time peak. In relative terms, the total number of apprentices has been increasing more rapidly than the total number of craftsmen. Furthermore, studies dealing with individual trades indicate a widespread tendency to place greater emphasis on apprenticeship as opposed to direct admission as a means of entry into the trades.*** The last decade has also seen marked qualitative improvements in apprenticeship selection techniques, in related instruction, and even in supervision on the job--much of this being due to the spread of apprenticeship funds and the hiring of apprenticeship coordinators.

4. Nevertheless, the quality of training may be a more serious problem than the sheer number of apprentices being trained. Related instruction in schools is spotty--ranging from poor to excellent. On-the-job training, too, is often weak. In terms of the individual employer's own selfish interests, the payoff is usually greater for giving apprentices narrow training. The splintering of the crafts and the increasing specialization of craftsmen contributes to both problems: it reduces both the willingness of employers to hire apprentices and their ability to provide all-around training.

5. Cost-benefit analysis here is difficult. For most individuals, apprenticeship probably pays off more than it costs in terms of foregone earnings. For society as a whole, we can be less sure. I suspect that economic analysis would support some expansion of apprenticeship, but the principles of marginalism would not

*For further discussion of this controversial point, see my "Union Policies..."

**Back in 1921, for example, Paul Douglas spoke of the "downfall of the apprenticeship system" and of "this system of apprenticeship, once so prevalent, now decayed." Paul H. Douglas, American Apprenticeship and Industrial Education (New York: Columbia University, 1921), p. 83. Similar quotes are available through the mid-1960's.

***See, for example, Ray Marshall, ***(cont'd) William S. Franklin, and Robert Robert W. Glover, A Comparison of Construction Workers Who Have Achieved Journeyman Status Through Apprenticeship and Other Means, Mimeographed, 1973.

justify a complete apprenticeship program for every last journeyman. However, apprenticeship can be supported on social as well as economic grounds. Ethnic minorities find it more difficult than whites to obtain the kind of informal training which leads to backdoor entry. Further, apprenticeship, the front door, is much more easily policed to enforce affirmative action than are devious backdoor alleyways. Even low quality programs give the apprentice some chance to learn how to adapt to the building trades environment and to pick up skills by watching others.

The discussion above leads me to two conclusions: (a) that some expansion of apprenticeship is socially desirable; and (b) that among the more promising means of achieving the goal of improved apprenticeship quality and quantity will be those which will transfer at least part of the cost of training from the individual employer to the industry as a whole or even to the government.

With this introduction, let me deal somewhat sketchily with some of the principal suggestions which have been made to improve apprenticeship quality and quantity. After discussing one suggestion which I think has but limited promise--shortening the length of apprenticeship--I go on to some that do--improving related instruction, improving training on the job, and greater use of apprenticeship funds. After this I end with a consideration of some additional proposals which I think create more problems than they solve: requiring employers to hire apprentices, requiring apprentices to become a journeyman, and subsidies and tax credits. My general thesis is that whatever the faults of apprenticeship, massive government intervention is not the answer.

Shortening Length of Training

According to conventional economic wisdom, apprenticeship takes too long, and by reducing its length we can increase the number trained. Whatever the truth of the first proposition, I feel that the gains from reducing apprenticeship length would be slight.* In the first place, many apprentices already complete their training in less time than officially scheduled. Secondly, employers tend to lose money on the early years of apprenticeship; only in the last year or so does productivity exceed cost; eliminate the last years and employer interest in the program may decline still further. Finally, in determining the number of apprentices to be admitted, JACs are concerned primarily with the number of new entrants which the trade can absorb each year; it is the flow of apprentices which is important, not the number in the pipe line at a given time. Thus reducing the length of training is not likely to lead to larger numbers being trained.

Rather than eliminate the last years of training, it might be better to encourage the development of preapprenticeship programs which shift the cost of early training from the employer to

*For a fuller discussion, see my "Minority Membership in Apprenticeship Programs in the Construction Trades: A Comment," Industrial and Labor Relations Review, Vol. 27, No. 1 (October, 1973), pp. 93-99.

the school system--and so shorten apprenticeship at the beginning rather than the end. For example, the East Bay Sheet Metal program provides for several months of full-time classroom work (including considerable manipulative training) before the apprentice takes his first job. (Some preapprenticeship programs designed primarily for minorities have failed because they were viewed as competing with rather than strengthening normal JAC admissions procedures.)

Some experiments might be tried in "self-pacing," i.e., permitting apprentices to move through the system at a faster-than-normal rate if they can demonstrate that they are learning their job especially quickly. Accelerated programs should depend not just on doing well in related instruction, but also on the ability to pass manipulative tests.

Improving Related Instruction

Elsewhere I have discussed related instruction at some length.* The appropriate mix between classroom work and training on the job undoubtedly differs markedly from trade to trade. Certainly there is no reason to believe it should be exactly 144 hours a year for every craft. At least in some trades the amount of time spent on manipulative skills (as opposed to "theory") should be substantially increased, thus again shifting part of the training burden away from the employer and also increasing the likelihood of developing general as opposed to narrow skills.

In addition, many of the old skills which required high degrees of manual dexterity and knack are becoming obsolete, while newer skills, such as electronics, are increasingly intellectual and therefore better learned in school. In an era of rapid technological change, when parents learn "new math" from their children, it may not be sufficient for "old masters" to pass on their "mysteries" to their juniors. A hundred years ago, clerical work, accounting, and even law and medicine were learned largely on an apprenticeship basis. Today these occupations are learned largely in schools and universities. And, so it can be argued, there is every reason to expect the same development to occur at least to some extent among the few occupations still considered apprenticeable. But changes of this sort require greater public or industry investment in training facilities and equipment and reduced union suspicion of the school system.

There is no need for all classes to be held at night, when apprentices are tired. In some trades in Ontario, as well as in some northern U.S. cities, apprentices go to school full-time during the winter months, and at times receive pay for their efforts. Programs such as these might well be expanded--especially in the off-season--provided that the cost is borne by the industry as a whole, not (as in Wisconsin) the employer. "Block-release systems," widely developed in Europe, which permit students to work full time at school, might be tried here. Economies of scale can sometimes be obtained by providing joint classes in subjects such as math which are of value to several trades.

More can be done to improve the quality of classroom instruction. Some suggestions are offered in my previously cited article. Among other things, the industry and society generally should spend more money on keeping instructors up to date and developing more effective training aids, such as better textbooks, videotapes, casettes, programmed teaching devices, and the like.

*"Apprentice-Related Instruction: Some Basic Issues."

I think we should adopt more generally the practice followed in many European countries and in a few trades in this country: before being admitted as a journeyman, an apprentice should be required to pass a comprehensive written and practical test--perhaps one taking several days--and the appropriate testing agency would seem to be the international union, perhaps along with the national employers association. In any case, related instruction and apprenticeship generally will be made meaningful if apprentices realize that they must demonstrate a certain standard of competence before being admitted to journeyman status.

Improved Training On The Job

As mentioned above, it is often in the employer's interest to offer only narrow training and to use the apprentice as "cheap labor," especially given the high turnover of both apprentices and journeymen. Even where the employer tries to provide broad training, the scope of his operations may not permit this; further, his supervisors may lack appropriate training skills.

Too little attention has been given to this subject. Although almost every trade has a set of "standards" which specify in considerable detail the exact number of hours to be devoted to each aspect of their trade, these standards are generally viewed as suggestive rather than mandatory. Every apprentice questioned on a 1953 San Francisco study had skipped training in at least one major aspect of his trade listed in its standards.* Forty-four percent of completed carpenter apprentices studied by Sara B. Smith reported that they had no training in stair-building, though this was a required area of training. JAC rules often require each apprentice to fill out a monthly report listing the work he has been doing. Unfortunately, these requirements are often ignored, or the reports are falsified.

Only partial solutions are possible for these problems. Business agents or JAC training coordinators can attempt to police training, but if they police too closely employers may decide the program is not worth the trouble and withdraw altogether.

Some of the better programs provide for systematic, periodic rotation of apprentices among employers--typically once every six months or year. Such rotation greatly increases the apprentice's range of experience; it makes it possible to utilize employers who engage in only one specialized branch of the trade; and it also helps apprentices learn how to get along with supervisors and journeymen in a wide variety of situations (a skill which is apparently not easy to learn). A carefully planned rotation system places apprentices on jobs with increasing difficulty and is also closely integrated with the material the apprentice is learning in school.

The Role of Apprenticeship Funds

A major development in apprenticeship in the last decade has been the growth of apprenticeship funds which are established through collective bargaining and financed by employers on a cents-per-hour basis for every union member employed. Since all employers must contribute, whether they employ apprentices or not, such funds represent an important means whereby training costs can be spread over the industry generally. Somewhat equivalent funds have been established in England, except that the "taxing power" of

*Joseph Orichelli, "The Work of Apprenticeship Committees," unpublished Ed.D. Thesis, University of California, 1955.

British funds rests on law rather than collective bargaining.

Funds can be used for a variety of purposes. Most typically, they finance the work of coordinators who handle paper work, dispatch apprentices to employers, persuade employers to take on apprentices, and sometimes check up on training adequacy. In addition, funds are often used to purchase equipment for use in related instruction, to provide training for school instructors, and even to supplement instructor's pay.

Funds serve a very useful purpose and their functions might well be expanded. Funds could well be used to provide subsistence for boys in pre-apprenticeship classes, to compensate apprentices for time spent in related instruction, and possibly even to subsidize employers for taking apprentices on (though I have doubts about the value of such subsidies--to be expressed below). I think it would be especially useful for funds to provide courses for foremen and supervisors to teach them how to be better instructors on the job. And, as suggested by the Somer's article in this collection, funds might also be utilized to finance demonstration centers to experiment with new teaching techniques and other innovative approaches to apprenticeship development.

Most of the activities listed above could also be financed by the federal government. Personally, however, I would greatly prefer them to be funded by the parties themselves. My biases here are largely philosophical. Since government manpower funds are limited, I would prefer to use them in sectors less able to finance themselves. I would like to encourage "home town" autonomous programs wherever possible, especially as a means of facilitating experimentation. Any widespread subsidization of unionized apprenticeship programs would raise the politically difficult question of whether non-union programs should be subsidized equally--an issue I would rather duck. And, finally, I suspect that the government bureaucracy working in this area has not been notably innovative (though there are some important exceptions to this statement). The government might well sponsor experimental and demonstration projects, but in general should keep its hands off the day-to-day operation of apprenticeship programs.

Requiring Employers to Hire Apprentices

One way to increase the number of apprentices is to require every employer to hire them. Today contractors working on certain California state construction projects are required to hire at least one apprentice for every five journeymen. The California rule may well have contributed to the fact the apprenticeship registrations in that state have increased by 75 percent over the last six years.

My own research occurred before this rule was introduced, and I would welcome reports as to its operation. Ten years ago there were similar provisions in some union contracts, but these were largely ignored. At the time, most contractors, business agents, and apprenticeship officials to whom I talked were opposed to such rules. They argued that the quality of training depends largely on the sincerity of the employer's desire to engage in training; the employer who is forced to provide apprentices is likely to put them on routine work on which they will learn very little. Furthermore, such rules would work hardships on the employer who must use fully qualified journeymen on all his operations (and so has no use for partially trained men). Administratively the handling of the inevitable request for exceptions would be quite difficult. Certainly there are many employers, who, because of the nature of their work,

are not capable of providing well rounded training (although rotation might ameliorate this problem).

On balance, these arguments against compulsory apprenticeship seemed persuasive at the time. While the number of apprentices would be increased, the quality of training might well suffer. And it makes little sense, especially in declining trades, such as the plasterers, to require that new men be brought into the industry while substantial numbers of experienced men are sitting on the bench.

The only reasonable arguments for a compulsory apprenticeship rule are the ones previously mentioned: (1) racial quotas are more easily enforced at the front door than back, and (2) even poor apprenticeship programs provide greenhorns some exposure to the construction environment. Nevertheless, I suspect that this rule is too inflexible, and I hope that it is dropped once the trades become reasonably well integrated. I note particularly that the rule's likely effect is to concentrate apprenticeship in highway and heavy when industrial and commercial normally offer more rounded training.

Restricting Trades to Apprentice-Trained Journeymen

A radical solution to the apprenticeship problem is simply this: restrict the practice of apprenticeable trades to apprentices and journeymen who have completed apprenticeship. Thus by locking the back door the demand for apprentices would be greatly increased. JACs and government agencies would be immediately granted the "leverage" required to force employers to provide high quality training, because under the circumstances the withdrawal of the right to provide apprenticeship would be a real hardship to the employer.

The solution is not so unconventional as it sounds. In Ontario to work in a "certified trade"--for example, as an electrician, plumber, sheet-metal worker, barber, or auto mechanic--a man must either be an apprentice or hold a government-issued certificate of qualification."* But such certificates are given only to those who pass a provincial examination. And with the exception of a grandfather clause, to take an examination one must have completed apprenticeship. In Wisconsin, plumbers, barbers, and watch repairmen must go through apprenticeship before they can take an examination for a state license. There are similar requirements in Oregon and perhaps other states as well.

Less drastic measures would also encourage apprenticeship. Without mandating apprenticeship training by law, the various levels of government could use their purchasing power to require that all government-aided construction be done by apprentices or journeymen. Unions could accomplish the same objective merely by refusing journeymen status to those who had not completed apprenticeship.

It all sounds so simple. Why aren't requirements like this more common? One reason is that they reduce flexibility. What is the employer (and the union) to do in time of peak demand? The employer would not be able to tap the vast pool of partially trained men who today move in and out of construction, depending on the needs of the trade. Even were union restrictions relaxed, the employer can make good use of only a limited number of apprentices. Beyond this point, it is more efficient (from the point of both the individual employer and the economy as a whole) to hire

*Exemptions are given in some cases to maintenance men working for manufacturing firms.

"Joe McGee's" who have already learned the rudiments of the trade on nonunion work. Similarly, unions prefer to take in temporary men on a permit basis rather than be burdened with an excessive number of apprentices for whom they have at least a moral obligation to provide steady work. Thus, though compulsory apprenticeship would almost certainly increase the number of apprentices being trained, it might well reduce the total number of individuals entering the trade (the number of new apprentices might not increase enough to make up for the elimination of the "Joe McGee's"). On balance, compulsory apprenticeship would also probably reduce labor mobility.

An equally serious problem involves public policy and role of nonunion employees. Would apprentices trained by nonunion employers be permitted journeyman status? If not, such a law would in effect mandate the closed shop for all work, since only graduates of union apprenticeship would be allowed to work. Certainly unions are likely to oppose government recognition of nonunion programs. In Oregon, compulsory apprenticeship was used as a weapon in jurisdictional warfare: the AFL-controlled apprenticeship council denied recognition to apprenticeship programs established in CIO-organized industrial plants, in effect forcing these firms to hire AFL (or at least AFL-trained) electricians and plumbers to do their maintenance work. (The law was changed somewhat after a sharp political fight.)

Thus I have some hesitations about endorsing compulsory apprenticeship. Given the past history of discrimination, corruption, and dictatorship in some of the trades, I would insist on a close governmental regulation of the selection process--perhaps even more restrictive than that required by current equal employment regulations--before laws were passed requiring apprenticeship to practice a trade.

In addition, I am concerned that compulsory apprenticeship may in effect freeze the technology. By restricting the practice of <u>any</u> aspect of the trade to those who have been trained in <u>all</u> aspects, we might well prevent new trades from arising. There is always the possibility that men will be required to learn much more than they will ever need on the job and that excessively high requirements will be used to restrict entry and raise wages. All these dangers exist under the present system, but they are less serious because the ever-present competition from "Joe McGee's" and nonunion firms helps keep down abuses. As we know from experience, the construction trades <u>can</u> set the pace in an inflationary spiral which <u>can</u> damage the economy as a whole.

<u>Tax Credits and Subidies</u>

A less radical approach than compulsory apprenticeship is to encourage apprenticeship through tax credits or subsidies. It is argued that, even with subsidies, apprenticeship would be a bargain for the taxpayer, much cheaper than vocational education.

Who should receive the support the apprentice or the employer? The answer depends in part on whether the main problem is a deficiency in supply or demand. (I assume, realistically, that apprentice wage rates are unlikely to change.) The GI Bill, which subsidized apprentices, operated to increase supply. Subsidies today might have the same impact and might also lower the dropout rate below its present 50 percent level (though I suspect that low wage rates are not the primary cause for dropouts). However, if, as I have argued, the main problem is lack of employer demand, then it is the employers, not the employees who should be subsidized (though subsidies in the forms of

allowances for preapprenticeship training might be justified).

There have been numerous proposals that employers be granted credits against their income tax for employee training expenses. The argument is that training is an investment in human resources and should be treated at least as generously as investment in non-human capital. Equitable as such a proposal may seem, it has its disadvantages. The "tax credit tends to be a uniform, blanket type of incentive," Lester says, "under which it would be difficult to direct the program in line with development needs or raise training standards." Since all training programs would be covered, almost regardless of quality, the government would be denied an important form of leverage which might be used to raise quality. The credit would be administered by the Internal Revenue Service, hardly manpower experts. Finally, the tax credit would provide an incentive only to firms making a profit.

As Lester suggests, "A subsidy program is more flexible and better adapted to allocation of training resources according to national requirements and changing needs of the economy as a whole." One form of subsidy exists today in the form of the on-the-job training program under the Manpower Development and Training Act or the JOBS program. There are some problems with MDTA-like subsidies. Particularly in periods of high level employment, one may suspect that a considerable portion of OJT-backed training programs would have been started even were federal subsidies not available. Another problem relates to accounting difficulties in segregating training costs. Certainly not all of apprentices' wages should be included, unless these apprentices do no productive work at all. Similarly it is difficult to calculate the percentage of the foreman's time devoted to training, as opposed to ordinary supervision. (This problem is less serious when companies are paid at a flat rate per trainee, regardless of alleged costs.)

Subsidies, either from industry training funds or from the government, are a useful means of providing an incentive to employers to take on trainees and of shifting training costs from the employer to the industry or society as a whole. Were the government to promote new forms of training and to subsidize these with MDTA-type grants, then apprenticeship (or quasi-apprenticeship, if you like) might be extended into a number of occupations such as computer repairmen or even salesmen. Subsidies might also increase apprenticeship, in its present form, especially in trades such as machinist and auto mechanics--trades which share many of the social and economic characteristics of the building trades, but lack their strong unions. Even within the building trades, subsidies should have some favorable effect. Nevertheless, I suspect subsidies will provide a smaller marginal return (in terms of both quality and quantity of apprenticeship) per dollar spent than some of the more modest proposals (such as training foremen to be trainers) made earlier.

Rather than the across-the-board use of subsidies, I would utilize the muscle provided by federal funds judiciously--to institute specific reforms and especially to encourage the demonstration of experimental new approaches to training. Funding should be used chiefly to increase quality rather than quantity, to raise standards, but not at the cost of imposing uniformity.

Conclusion

Apprenticeship has been attacked

as an anachronism. Perhaps so. But within its area of strength, the building trades and a few others, it is a thriving and even dynamic institution which has shown at least considerable ability to adjust to a changing environment and today is characterized by much healthy ferment.

Despite its limitations, apprenticeship makes a modest but useful contribution to our national manpower program. Apprentice-trained journeymen earn more and have more secure jobs than do "Joe McGees." There is also reason to believe that they adjust more easily to technological change. In a nutshell: apprenticeship raises standards (though not as much as it might) far more than it restricts entry. For this reason I believe that apprenticeship--in one form or another--deserves some expansion.

Our expectations as to expansion should be modest, however. Certainly apprenticeship will never play the role in this country, where the typical apprentice is a high school graduate and begins training in his twenties, that it does in Europe, where apprenticeship in effect serves as a substitute for high school. It is unrealistic to expect all journeymen to be apprentice-trained, particularly since the industry has adjusted to large numbers of partially trained men. Furthermore, unless drastic steps are taken, employers are not likely to hire substantially greater numbers of apprentices. Drastic steps are not urgently required since apprenticeship seems to meet the need for key men, at least in construction. And drastic steps, such as compulsory apprenticeship, run the risk of reducing manpower mobility.

Instead of seeking to provide every journeymen full apprenticeship of the present sort, it may be more helpful to experiment with a wide range of programs in addition to apprenticeship for those who are presently not receiving formal training at all. Some of these alternate routes to skill may be shorter than most contemporary apprenticeship (and frankly designed to turn out only semi-skilled workers); some may provide a greater component of in-school training; and some may abandon the goal of turning out all-around craftsmen and instead concentrate on specialized skills. (Present "trainee" programs might provide one model for these; European "modular training" programs might provide another.) Still others might enlarge on present "journeymen training" programs designed chiefly to upgrade the skills of partially trained "Joe McGees." Whether any of these new programs should be called apprenticeship is a matter of semantics. To the inevitable criticism that such flexibility will reduce standards, it may be replied that today standards for "Joe McGees" are already low!

Any recommendations regarding apprenticeship must always take into account that it is largely intermeshed with collective bargaining. Collective bargaining in the building trades is largely decentralized. Changes introduced from outside are bound to be resisted. The trick is to get local JACs to experiment on their own and to develop the particular forms of training programs most suited to their own needs. There is a great deal the parties can do on their own. Apprenticeship's character as a grass-roots program should not be destroyed.

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As the Strauss overview suggests, improvement of training methods merits the highest priority in apprenticeship programs. The following research speaks to that need, as it describes a promising project in training for the metal and machine trades. As a first step, a detailed analysis was made of the tasks required for competent on-the-job performance of specific skills; from these data, appropriate teaching materials were designed to allow apprentices to pace themselves during the related instruction component; then, as each module was completed provision was made to reinforce what had been learned by immediate, practical application on the shop floor. It should be noted that the teaching model described here incorporates 12 of the 16 criteria which the "Purdue Study" set forth as representing an "optimum" training system. The "Purdue Study," completed in 1969, was conducted under a contract with the Office of Research and Development of the Department of Labor's Manpower Administration by Professor Alfred S. Drew. The study, published as a monograph titled "Toward the Ideal Journeyman," appraised the strengths and weaknesses of the apprenticeship system in order to identify elements in an optimum training program.

DEVELOPMENT OF A PERFORMANCE BASED INDIVIDUALIZED SYSTEM FOR TECHNICAL AND APPRENTICE TRAINING

Arthur Oriel

The major objective of this study is to improve modern instructional technology so that it will:

(a) Utilize individual differences in learning ability by allowing each trainee to pace him(her)self.

(b) Base progress through the curriculum on demonstrated task achievement rather than a specified number of hours.

(c) Enable apprentices with an appropriate, though modest, verbal skill to complete programs successfully.

(d) Require that all apprentices achieve the same high level of performance in both shop and related instruction, though some apprentices may require a longer time period than others.

(e) Increase training efficiency by minimizing or eliminating gaps in time between learning and applying acquired knowledge.

(f) Offer a viable alternative to apprentice-selection tests in current use, which not only fail to predict accurately job performance, but, in addition, often serve to exclude many potentially competent recruits.

(g) Lift much of the burden of the instructional process from the journeymen who have neither the time nor expertise to be competent teachers. Journeymen can be trained to guide apprentices, and their experience is useful in helping

trainees refine and polish on-the-job performance. Key to this objective is the design of teaching materials to serve as the student's primary source of information.

The initial step in the research required making a thorough analysis of the tasks normally required of first-year metal and machine trades apprentices, so that a set of behavioral objectives and detailed specifications for a training system could be developed to produce competent task performance. Most important of these is to understand the nature and difficulty of the learning process as it applies to someone who needs to be taught a specific task.

Four companies participated in the study: Chrysler Corporation, International Harvester, Caterpillar, and the Mercury Division of the Brunswick Corporation. After studying all the major technical operations normally required of first year apprentices in these companies, curricula were developed consisting of 17 study units for related instruction plus 31 audio-visual units to be used by the apprentice on the shop floor as he familiarized himself with four machines: mill, drill, engine lathe and surface grinder.

Trainees were sought who have a six to eight year reading level; but it soon became evident that the sixth-year level reader, particularly one from a disadvantaged background, tends to get someone else to read for him. Those with a seventh-grade reading level were able to cope with the prepared materials.

A series of uncontrollable events prevented the researchers from securing as large a group of apprentices as they had hoped, to participate in the experiment; in all, there were 47, half of whom (24) had completed the course at the time of the report, with the remainder (23) in the process of completion. A control group of apprentices in various stages of completion of a traditional first-year training program served as a yardstick.

Ideally, the program provides for each work day to be divided evenly between related instruction and shop instruction, but only one of the companies was willing to follow this schedule. Results of the importance of this factor, therefore, are not conclusive.

Each trainee takes a pre-test before undertaking a training unit. If he scores 90% or better, he need not complete the module; less than 90%, he must complete the module and take a post-test. If the post-test score is less than 90%, the apprentice must restudy the unit and take the test again. (The procedure was followed in only one company, and the rate of different tasks.) The trainees themselves indicated they felt competent to perform any first-year job on the shop floor. Finally, there are indications that self-pacing allows trainees to perform well; this seems to be borne out by the average post-test scores, which were better than those normally encountered in conventional training programs.

Using this teaching method, the traditional 2,000 hours of shop instruction seems to be a questionable requirement; self-paced apprentices in the study spent about 40 hours on the bench and at the basic machines for each instructional component, and then they were given three additional assignments to increase familiarity with the machine's operation. No apprentice in the sample had a

self-paced tempo which was slower than the hours allotted in traditional programs. Those failures that did occur were the result of impulsiveness--e.g., haste or carelessness which revealed a tendency toward injury--or inability to reach the required precision level.

Although it is impossible to project the performance difference between those who receive related instruction in bits and pieces over an extended time period without immediate on-the-job reinforcement, versus those who receive training in the intensified way set forth in this model, the researchers posit that the latter method pays greater dividends.

Finally, it would appear that apprentices with 7th to 10th grade reading levels are the most appropriate recruits for this instructional method. Those with 6th grade reading levels or below tend to rely on other people to translate the written word for them, while those at the 11th level or above have more facility than is required, even for so sophisticated a learning task as tool and die making.

Since the study is still in progress, recommendations arising from its findings are necessarily tentative. Nonetheless, it would appear that:

1. For maximum efficiency, apprenticeship training programs should be developed from clearly stated behavioral objectives, arising from carefully conducted task analyses of the work to be performed in any given phase of training.

2. Emphasis should be on performance rather than numbers of hours spent in learning, both for movement through a course and completion of it.

3. Performance measurement requires the development and standardization of reliable and valid tests, to provide objective evaluation. Such tests are consistent with the provision of the Civil Rights Act.

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Related instruction, as it is traditionally defined, means formal classroom training which takes place away from the job site, even though manipulative skills may be involved. The research which follows indicates considerable variability in the quality of related instruction and its relevance to job performance, depending in large measure on the course objectives and who designs the curriculum.

RELATED INSTRUCTION: IS IT RELATED?

Steven Swanson, Morris Horowitz, Irwin Herrnstadt

Data for this research were gathered through personal interviews with apprentices, mail questionnaires to journeymen, and discussions with apprentice administrators, company and association training personnel, and school staffs in three trades: operating engineers and electricians in the construction industry, and machinists in manufacturing.

The two unions surveyed for this research were the Boston based locals of IBEW and IUOE. A number of differences were noted in their apprenticeship programs. For one thing, IBEW's international union plays an important role in curriculum design and content; IUOE's course of study is generally developed at the local level. As for application of classroom instruction, an IBEW apprentice generally performs the same tasks on the job he will perform as a journeyman, and his work is consistent with the related instruction he receives: an IUOE apprentice works as an oiler (i.e., lubricating, performing minor maintenance, and working as a flagman when necessary) which are not at all the functions he will perform when he graduates to journeyman status. In short, whereas IBEW uses related instruction to explain the theory behind work tasks, IUOE's related instruction is designed to compensate for lack of practical, on-the-job experience.

Two regression models were constructed, and relevant interview data were computerized to determine the effect of related instruction to job performance. The variables tested were the student's grades, conduct and effort in the courses; the number of absences; and the work average (i.e., the grade given an apprentice by the journeyman he is assigned to on the job). Of them all, grades earned in courses appear to affect regularity of employment and some few other marginal benefits. Overall, however, the researchers conclude that related instruction as it is presently devised has a minimal effect on job performance.

The researchers conclude, too, that related instruction in large measure is affected by the objectives of each training program, and since these differ from craft to craft (e.g., some programs train apprentices to become journeymen, others for eventual supervisory positions) so does course content.

A major sticking point in related instruction is that frequently it is expected to compensate for lacks in basic education (reading and math particularly) as well as orientation to the work world. On the other side of that coin, apprentices frequently are denied credit for previous work and educational experience, and consequently, they are forced to repeat material they already know.

Findings and Recommendations

This research project dovetails with and supports many of the findings of the two earlier reports: the need to take individual dfferences into account when designing curricula for related instruction; the necessity for reinforcing quickly what was learned in the classroom with practical, on-the-job application;

the necessity for both manipulative and theoretical courses; the basic necessity for simply providing some form of related instruction to the many apprentices who receive none. Additionally, it identifies two other trouble spots which need correction and strengthening: the role of the public education system in providing an effective bridge from school to work; and failure to give credit to apprentices for previous training in subjects which they are forced to repeat as apprentice-trainees.

Recommendations arising from the findings of this study are:

1. Related instruction curricula should vary, depending on the differing objectives of each apprenticeship programs. To impose uniform requirements across all trades is seen as self-defeating.

2. Efforts should be made to develop objective tests, so that apprentices with previous training and/or work experience will not have to repeat what they already know.

3. Greater effort should be made by the public schools to encourage career decisions well in advance of separation from these institutions, so that students can be better prepared to enter the world of work.

4. More effort needs to be made by the public schools to ensure that students have a firm grounding in reading, writing and math, all of which are basic to the craft trades.

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Despite weaknesses in the apprenticeship system as it is presently constituted, reports the following research, it still remains the surest and best way to develop skill capacity. In our striving to make our training capacities more productive, we must give innovative programs and experiments maximum public exposure by setting up government-funded demonstration centers, where projects may be objectively and systematically reviewed by competent researchers.

EXPERIMENTATION AND INNOVATION IN TRAINING FOR SKILL

Gerald Somers

This research was undertaken for the specific purpose of testing the desirability and feasibility of setting up one or more experimental demonstration centers to be sponsored by the Manpower Administration, or some agency of the

Federal Government.

To test the idea, extensive interviews were conducted with employers, union officials, vocational educators and government personnel associated with apprenticeship training. Illustrative of the kinds of projects interviewees were asked to respond to were:

1. Government financing of certain phases of the training process, including some form of subsidy for related instruction, and projects for updating and upgrading journeymen's skills.

2. Development of a curriculum for related instruction in subjects basic to a number of crafts which could be taught to all apprentices regardless of their craft specialties (e.g., math, blueprint reading, tool-handling, labor-management relations).

3. Development of TV programs in related instruction for apprentices based in remote areas where there are good classroom facilities, and tying in with Satellite installations to beam them wherever they are needed.

4. Demonstrations and experiments with apprentice selection procedures, to increase retention rates.

The projects above all received strong endorsement from respondents, but special enthusiasm appears to have been expressed for methods of updating and upgrading journeymen's skills.

Demonstration centers would serve a four-fold purpose: first, they would supply needed facilities, since the training centers currently in operation do not permit experimental or demonstration projects because they tend to be immediate and specific; second, certain innovations in apprenticeship and skill training which originated in Europe and Canada are worthy of careful study, but they must be tested in the American context before adopting them; third, although many valuable innovations are taking place in the United States which may be susceptible to wide use in craft training, they are carried on in so scattered a fashion that they do not receive the national attention, or "spotlight" that is necessary for their application on a broad scale; fourth, federal-funding of demonstration centers would ensure record-keeping of the economic and social costs of demonstration projects, and would provide a means of objective assessment for each program.

Findings, Discussion Points and Recommendations

Data retrieval of successful - and unsuccessful-experiments in apprenticeship training is vitally necessary if we are to develop a strong program nationwide. In a poll of the forces generally responsible for apprenticeship training in the State of Wisconsin, for example, vocational educators, apprenticeship councils and government representatives - all respondents signaled the time was ripe for a unified approach to the problem.

In addition to the recommendation that government funds be used to subsidize the center and some programs, the research suggests that "judicious payment to employers and trainees" should be made, to encourage their participation in center projects.

A number of existing installations were identified by the presentor as possible centers.

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Thus far, we have concentrated on apprenticeship training in the unionized sector. The following research sheds some welcome light on the problems of training in the non-unionized home building industry. For a more definitive treatment of the labor market in non-union construction, readers are advised to see Foster's article, "The Labor Market in Nonunion Construction" in the July, 1973 issue of the Industrial and Labor Relations Review.

TRAINING IN THE NON-UNION SECTOR OF CONSTRUCTION

Howard Foster

This research was undertaken to investigate the training activities in the home-building sector of the construction industry, a major center of non-union activity in the field. The laboratory was Erie County (Buffalo) New York, where responses to a questionnaire were obtained from 33 builders and 57 sub-contractors who supply a variety of craft services.

The absence of worker-respondents in the study necessarily leaves gaps in information, particularly to questions about previous training.

In what appears to be a fairly typical pattern nationwide in this sector of construction, Erie County offers no formal industry-wide program for skill training, and few employers offer systematic training of any type (55 of the 70 respondents in the study engage in no training outside the job). By and large, then, skills are acquired (1) haphazardly on the job, or (2) from other sources (including trade schools, community colleges, service schools run by material suppliers, or some experience in the unionized sector) leading to the conclusion that the preponderance of workers in the home building industry are, at best, marginally skilled. Expertise comes from a few "key craftsmen" who direct the work. When construction activity is low, this arrangement appears to suffice; when it quickens and extends to the unionized sector, the lure of higher wages, fringe benefits and overtime are hard for the highly skilled to resist; consequently, in times of high employment in the industry as a whole, the home builder is frequently left without competent supervisors. Nor are highly skilled

replacements likely to be developed from among the current body of workers, whose personal histories show that (1) previous experience was largely in farming, and (2) only eighteen (18) respondents indicated that members of their work force had friends or relatives in the construction industry, a factor given considerable weight as a means of attracting to and holding people in a craft.

One program (the only one in Erie County) has been going on for six (6) years in carpentry under the auspices of the National Home Builders' Association and funded jointly by the Departments of Labor and HEW. This program appears to have been successful, especially to the degree that it has attracted minorities to home building. (Successful completion of a 22 week pre-apprenticeship program makes a trainee eligible to go on to a regular apprenticeship program.)

Asked about the desirability of a training program, administered perhaps by the NHEA and combining on-the-job training with classroom instruction, respondents generally agreed that it would be a good idea, although sub-contractors were less sanguine about it than builders. (29 of 33 builders responded affirmatively, while only 33 of 57 sub-contractors agreed.) When the idea of contributing to the cost of such program was broached, some of the support for training eroded (40 respondents were willing to contribute, 8 were unsure.) Major drawbacks appear to be: (1) trained workers would leave for more lucrative employment; (2) the related instruction component is unimportant; or (3) in the case of sub-contractors, distrust of the NHEA.

Given the obvious good health of the home-building industry, its sensitivity to the vagaries of market demands in the construction industry as a whole, and the generally favorable attitude of Erie County's builders and sub-contractors to training, the research concludes that a structured system for skill training be undertaken, with costs shared by industrywide assessments plus subsidies from federal manpower programs.

Because of the absence of worker-respondents in the study, it is recommended that additional research be undertaken to discover what experience workers in the home-building sector may have had which is unknown to the employer.

Given the small sample of the study, further efforts should be made to check ABC training availability which extends to small apartment building workers, and, therefore, overlaps into home building.

Further investigation should be made into the composition of workers in the home-building industry, to procure a reliable breakdown of the number of minority craftsmen working in the industry.

Other recommendations include:

1. The development of formal training programs in home building must be the result of initiative by the industry itself, if it is to work. To generate the necessary funds, money should be raised through special assessments on HBA members, with a tax imposed in direct relationship to the size of the firm and the potential benefit it will derive from a training program.

2. Arrangements should be made with local educational facilities to supply facilities and instructors for the related instruction component. (A mutual benefit is seen here, since it would ensure that vocational educational establishments provide curricula consistent with the needs of employers.)

3. Since the public will be better served as a result of training which will improve the versatility and skill of the industry's workers, training subsidies from federal manpower funds are recommended, but only to the extent that they "encourage the industry to develop its own permanent training institutions."

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The trade-union view of apprenticeship training which concludes this section of the report sees massive changes in vocational and secondary public school education as the critical first steps to improving skill training. Beyond that, applied researchers are urged to spend their efforts in areas that do not infringe on practitioners' prerogatives. Finally, it is felt the public must be re-educated to appreciate the value of manual labor.

Because of its brevity this paper by Reese Hammond, Research and Education Director of the International Union of Operating Engineers, is not summarized. It is included as presented.

A TRADE UNION PERSPECTIVE ON APPRENTICESHIP RESEARCH

Reese Hammond

A federal education effort that provides 80% of its financial support to the 20% of the nation's children who complete college, while tossing the remaining 20% to the youth who find their way into the work force without any B.S. needs reform. The efforts of a relatively small group of researchers in the limited area of apprenticeship may have some impact on this situation, but there is certainly no assurance that they will.

Apprenticeship programs in the construction industry don't need a large infusion of federal money. If the public school systems did their jobs properly and produced a literate young person to enter the trades, the apprenticeship system could proceed forthwith to turn out a respectable journeyman mechanic. Unfortunately, in all too many instances the public schools are not doing their job.

It is important to accurately determine where the real problem lies. No effort--real or cosmetic--at the post secondary level can make up for the loss of time and the dulling of motivation apparent in all too many secondary school graduates, to say nothing re drop-outs. They may be brought up to par, but what finer levels they could achieve had they avoided a two or three year plateau of discouragement and indifference.

The redistribution of federal aid will benefit apprenticeship most if it results in a general elevation of the quality of the secondary student who is not college bound at high school graduation. Without acknowledging the accuracy of all of the manpower forecasts flowing from Washington, it is important to note that eight of every ten jobs that will be waiting for high school graduates from 1975 on will not require a college degree.

Most of this reshaping, if it occurs, will undoubtedly come from the HEW side of town, and so to me it makes sense for apprenticeship researchers to maintain a close relationship with researchers in general education--not only to avoid duplication, but to seize opportunity when it arises. Apprenticeship may be the tip of the tail of the educational dog--the numbers are relatively small--so it is impractical to assume that it will shake the establishment very much. But apprenticeship researchers are the intellectual cutting edge for the apprenticeship system, and as such, the system and its practitioners depend on you to defend the best of our interests.

In that defense, the limited resources of the Office of Research and Demonstration should be directed to those areas where academic research does best. Just what areas lend themselves to such research is not always clear, but subjects that have a low threshold of acceptance by practitioners are attempts to establish admission policies; determine entrance requirements and revise course content of related training. Unfortunately, in the present climate the first two problems won't respond to reason. The course content of related training is, and should be determined by practitioners and manufacturers. While a case might be made for a closer correlation between classroom training and its application on the job, an equally strong case can be made for full-time blocks of training interspersed throughout an apprentice's career, with only limited correlation to on-the-job training.

Researchers and Practitioners

The October 1971 conference was conspicious by its almost total lack of practitioners. That fact may be as much the fault of the practitioners as the conference planners, but a review of the proceedings indicates no trade unionists, no employers and perhaps one or two training directors present. The present program, on the contrary, contains several practitioners. This is all to the good.

Research and researchers are important to the apprenticeship system, but the apprenticeship system is important to researchers, at least to apprenticeship researchers, because if there was no apprenticeship system there would be no opportunity to research it.

The application of research in apprenticeship can, and should, be tempered by a recognition of the problems in adopting the results of such research. The purity of research does not have to be compromised to

be practical, and apprenticeship programs don't have to be compromised to incorporate the results of valid research. The problems inherent in bringing about change in apprenticeship as the results of research are one and the same, as with any change in trade union policy. Simply put, trade union participation in the economy of the United States, unlike Western Europe, is still suspect. The open shop, Construction Users Round Table, Right to Work committee approach is flatly anti-union. This open hostility affects trade union ability to treat issues solely in a philosophic or economic context. The politics of staying alive is the first issue of concern. This affects manpower training and apprenticeship as it is, among other things, an economic issue. Academic research conducted in the past, which has not been accepted by practitioners, might well be tested in the crucible of real life before more tomes are laid upon the volumes of research that already exist. Such a transfer of ideas into reality--the essence of craftsmanship--might even be a condition for further ORD grants.

Constructive Criticism vs. Academic Chauvinism

Apprenticeship research should, for a while, be directed primarily in the area of applied research. The apprenticeship system needs constructive criticism. The decision an 18 or 20 year old or even 22 year old makes in entering apprenticeship is the major decision in his life to that moment. Unlike many of his contemporaries who have postponed such a major decision for a college trip, the apprentice, at a relatively young age, has made a career choice. This decision deserves the best kind of program that can be devised, and any program that is uncriticized cannot endure in a meaningful way.

Constructive criticism however implies at least a basic belief in the process or institution under observation, or why bother to take the time to criticize. The apprenticeship system isn't helped by a conclusion that we don't need it. Studies of alternate methods of training should not be conducted under the guise of apprenticeship research. Many people who have never worked in apprenticeship, or with its end product, are against apprenticeship and they have that right. Those of us who have worked in apprenticeship and with the journeymen it produced have the right to ignore the denigrators, even at our own peril.

Unjustified criticism has many roots, including ignorance, but perhaps the most pervasive source is the American middle class, middle aged bias against anyone outside the white collar work force. This is identified by a pathological belief that it is better to work with your head alone than with your hands, or your hands and head.

The philosophy leads to the conclusion that it can't be too difficult to learn a trade, and if it's not too difficult, how can the job be worth $8 an hour? The answer is "of couse it can't be worth $8 an hour." The net conclusion is that while many critics, both academic and non-academic, give philosophic commitment to equal social status between the white collar jobs and the tradesman, they reject such equality emotionally.

One of the logical results of such reasoning is the perennial cry to shorten the length of apprenticeship. Little evidence has been developed to

support the abbreviation of good apprenticeship programs. While apologists for dropouts present many arguments to persuade us that apprenticeship is overlong, the economic facts suggest that the three to four years spent in apprenticeship is a wise investment. In the Operating Engineers trade an apprentice starts at 65% of the journeyman's rate, very, very seldom under $4 an hour. Average hourly rates in manufacturing are $3.81 per hour and in the service trades $3.18 per hour. Most construction apprentices start work at better wages than their contemporaries and they have a guaranteed future career.

Long-Range Support for Apprenticeship

While trade unions vary widely in their commitment to training, craft unions have historically assumed the role of preparing mechanics for industry. This remains a major concern of Building Trades and Metal Trades organizations. A long-range program to assure the continuous flow of talented and ambitious youth into the trades is under consideration by both ALF-CIO Departments. A preliminary look at some of the input into such a long-range program may be interesting to apprenticeship researchers. Hopefully, the current efforts of the United States Office of Education in developing the career education concept will be modified to include some of these proposals.

At the preschool level, "Sesame Street" or a similar type program should include a tradesman as a regular member of the cast. From time to time, mechanics from other trades would visit on the show and discuss, in appropriate terms, the kind of work they do.

For the elementary school level, an ongoing program with appropriate universities should be developed cooperatively with the State Building Trades Councils to provide teachers at grades 4-7 the opportunity to work during a summer in the construction industry. They work five days a week, and attend seminars on Saturdays to learn basic, accurate information about opportunities as tradesmen in the construction industry. During an experimental program in 1970, the University of Hartford cooperated with the Connecticut Building and Construction Trades Council in such a program. Eight of 27 starters completed the program and returned to their elementary classrooms with new insight to pass on to their students. For this effort, they received six credits toward their masters' degrees, plus their wages for seven weeks work.

At the middle school level, the Industrial Arts Curriculum Programs (IACP) developed by Ohio State University should be widely adopted. "The World of Construction" and "The World of Manufacturing" are both 180 day curriculae aimed at 7-9 grade students. All secondary school students should be exposed to the full range of opportunities open to them, including opportunities in the construction industry, from truck driver or tradesman to architect or civil engineer. While the current material developed by the Texas Education Agency under a USOE grant is totally unacceptable, the Building Trades unions intend to work with employers in construction to develop a secondary level curriculum that will maximize options for individual students, and attract appropriate talent to sustain the construction industry. Short of the development of such a career curriculum, efforts will be directed towards reforming school systems so that they will graduate students able to read, write, reason and discipline

themselves. Those four characteristics, plus a familiarity with hand tools, should be the minimum requirements for entry into apprenticeship.

Dual Enrollment

The National Joint Apprenticeship and Training Committee for Operating Engineers is recipient of an ORD grant #21-11-73-12 to explore the possibilities of indentured apprentices matriculating in a two-year Associate program at cooperating colleges. Currently, there are four such programs under way, one in California, one in North Dakota and two in New York. We anticipate three more schools entering the program in September of 1973.

Beyond the administrative procedures, we are pursuing several other avenues. A major exploration is under way to determine the acceptability of the two years of credit received by the dual enrollee for transfer to four year institutions. It is too early to determine any pattern, but we feel there will be a reasonably high level of acceptability.

On another avenue, we are exploring the annual income of a sample of 400 registered apprentices against a control group of 400 members initiated into our local unions during the same year without benefit of formal training. This portion of the project is about 50% complete, but we have already determined that 84% of the apprentices indentured in 1967 are still active in the International Union, while only 57% of those initiated without formal training remain active. Both management and labor enthusiasm for the project remains high, and we anticipate continued expansions of the program.

Conclusion

The apprenticeship system needs all the friends it can get, not the least of whom are those persons from outside our ranks able to offer constructive criticism of what is being done. We need suggestions as to what might be done to improve the system. The Office of Research & Development should be a major source of such assistance.

CHAPTER II

LESSONS FROM FOLLOW-UP STUDIES OF JOURNEYMEN AND APPRENTICES

Introduction

Central to a successful redesign of apprenticeship training is systematized follow-up information gleaned from studies of completers and "drop-outs" enrolled in programs during the recent past. Is the education apprentices receive while participating in the process adequate and useful to the degree that they remain in the occupation for which they were trained? Does serving an apprenticehood provide completers with greater occupational and upward mobility than their less formally trained counterparts? What factors are likely to cause apprentices to become "drop-outs"? And, if training is terminated before completion, does it still have some value to the individual in terms of providing him with a marketable skill?

In this section, four investigations seek answers to these and related questions.

C. A. Pearce of the New York State Department of Labor offers a progress report on a far-reaching study of former apprentices in his state. Indications are that the data being amassed and computerized will provide interesting and useful resource material to researchers, employers, unions, and government agencies concerned with manpower supply and demand.

In a follow-up study of Wisconsin apprentices, Thomas Barocci suggests that the public interest will be well-served by an expansion of the apprenticeship system to trades not currently considered "apprenticeable" and he offers a number of recommendations to make the training process more flexible.

Carl Schramm's findings indicate that apprenticeship training has only a small effect on occupational mobility, but nonetheless brings economic rates of return of considerable magnitude.

Finally, the advantages of apprenticeship training are explored with exemplary thoroughness by Ray Marshall, William S. Franklin and Robert Glover, who undertook a nine-state study of representative construction crafts.

FOLLOW-UP STUDY IN NEW YORK STATE

C. A. Pearce

This research addresses the question: how well do register apprenticeship programs in New York State achieve the objective of developing qualified craftsmen and supervisory/managerial personnel in the skilled trades? To find out, the New York State Apprenticeship and Training Council set out to study the experiences of apprentices who completed or dropped out of apprenticeship training programs during a twelve-year (12) period (1958-1969). The project is still underway, and final results will be forthcoming.

The specific objectives of the survey are to determine:

a) Whether former apprentices--both completers and dropouts--are working or self-employed in the same "highly-related" trades in which they served apprenticeships;

b) What variables affect the relationship of the usual trade to the apprenticeship trade;

c) What effect apprenticeship has on earning capacity;

d) What factors serve to interrupt or abet completion of apprenticeship (e.g., credit for previous training, the apprentice's perception of his own competence during the training period, the variety and kinds of on-the-job training received);

e) How to improve the basis for estimating present and future supply needs for skilled craftsmen and related managerial workers.

Data have been amassed by way of a mail questionnaire to approximately fifty percent (50%) of those who received some apprenticeship training during the twelve-year period covered by the survey.

For purposes of analysis, the apprenticeship trades are combined into 28 groups, although there were some 250 different apprenticeship programs in operation in New York State in the survey period.

Based on preliminary returns, it appears that there is strong support for the value of apprenticeship training, at least insofar as completers are concerned. Data are much more difficult to elicit from dropouts.

It is expected that important differences among the types of apprenticeship training programs offered will show up in the results.

In-depth studies of the type outlined above will provide useful information that is totally unavailable at the present time to employers, unions and government, as well as researchers.

A number of questions were raised about the methodology used in the research. These are unreported here.

The remaining discussion revolved around the following queries: How were differences in the business cycle treated in re noncompleters? Inferences will be drawn from the calendar year in which training was interrupted. This would appear to be an important variable.

Does anything in the survey distinguish between union and nonunion employers? Yes, room for the name of the sponsoring union was allowed for on the questionnaire, but Pearce is not sure that this factor was or will be coded into the final results.

On the basis of these data, what kinds of decisions will administrators make? Aside from indicating variations in the quality of the programs, it will show up weaknesses. Part of the function of the final report will be to spot those weaknesses and irrelevancies, to the end that they may be corrected or deleted.

The discussion concluded with the assurance that the report, when completed, would be made available to responsible research organizations.

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What are the factors most directly affecting the apprentice retention rate? To determine at least some of the answers, the following study was conducted among dropouts and completers in the State of Wisconsin.

FOLLOW-UP STUDY IN WISCONSIN

Thomas A. Barocci

This research was undertaken to identify the determinants of success or failure in completing apprenticeship programs.

Wisconsin was selected as the laboratory. Since that State is generally acknowledged to have one of the best apprenticeship structures in the nation, it may be assumed that the findings in this report are, in general, applicable universally.

Information was obtained from a base of 1000 dropouts and 500 completers of apprenticeship training programs. As has been the experience elsewhere,* a much higher rate of return was received from completers (230) than from non-completers (246).

Common to all respondents was that pre-apprenticeship experience in the public schools was not a significant factor in preparation for training. Only 21% of all respondents discussed apprenticeship with their school guidance counselors or teachers; of these, 25% were discouraged from following the trades route.

The findings of the study indicate that six variables have an effect on retention of apprentices: occupational area; marital status; union status; years of education; sex; and the "index of rating" given by apprentices which includes quality of instruction, ability of instructors, working conditions, tools and equipment on the job, and adequacy of job rotation until all components of the job are learned. Four other variables, which did not seem to be relevant to this study but might prove to be significant using a larger sample are: length of indenture; race (only eight blacks were included in the study, all of them dropouts); labor market conditions; employer characteristics (Canadian research shows this factor to be very important vis-a-vis retention).

*See C. A. Pearce

Findings indicate:

1) Those most likely to complete apprenticeship training are white, males, married with dependents, and are union members.

2) Half of those who dropped out of apprenticeship programs are working in the same field in which they received some training.

3) Rotation on the job to learn all the facets of a trade is the most important component of the "index of rating" given by the apprentice.

4) Those with formal education beyond high school are less likely to complete apprenticeship training than those with an 11th or 12th grade education.

5) No substantive data are available on incomes of completers versus non-completers, but overall, the value of completing appears to be substantial--completers earn roughly $3000.00 more per year than their dropout counterparts (N.B. this amount is modified by occupation--in the service trades and graphic arts, dropouts earn about 90% of completers' salaries; in construction, the figure drops to between 70% and 80%).*

6) Union membership affects earnings positively. Union members earn approximately $1,600.00 more per year than those who are unorganized.

7) The occupational area in which training is received is an important factor in completion. The best chance for completion is in the industrial trades, with construction second, the service trades third, and the graphic arts last.

8) Some apprentices drop out after exposure to training, because they find that the field is not to their liking.

9) A high percentage of all respondents indicated that related instruction was not sufficiently related to tasks that had to be performed on the job.

Implications for Public Policy

Research endeavors must do more than pinpoint or patch up existing failures. Public policy must be induced to accommodate to changing needs. The following recommendations spring from the research:

1. Non-white, female and unmarried apprentices all appear to need special counseling, at least during the first two years of training.

*It is to be noted, however, that three respondents in the sample, all of them dropouts, reported incomes of $50,000.00 a year.

2. A greater effort needs to be made to facilitate the transition from school to work. Beginning apprenticeship training during the high school years and integrating manual and liberal arts courses in post-secondary institutions are suggested methods of implementing this recommendation.

3. Apprenticeship should be expanded to include occupations heretofore considered "unapprenticeable," for a variety of reasons:

   a. The apprenticeship system is vastly under-utilized at present.

   b. There is a nationwide concern about the quality of workmanship, or lack of it.

   c. There is new emphasis, initiative and immediacy about finding ways of facilitating employment for the nation's youth.

4. More flexibility needs to be built into the apprenticeship system. We have no mechanism now which allows adjustment for flow or fast learners, and related instruction is still in rudimentary form. The biggest roadblocks to change are the unions, because of vested interests and tradition. This difficulty ought to be resolved quickly, and the best probable starting points are the international unions or the AFL-CIO.

5. The length of apprenticeship programs should be examined carefully. If an apprentice needs--or wants—to learn only generalized aspects of a trade, it should be possible to offer programs of shorter duration. This is particularly applicable to trades outside of construction.

6. Some system of government financial assistance to employers should be devised. Tax credits are one method, and may be especially important during the first year or two of training when the apprentice's productivity is marginal. During the last two years of training, the employer is better able to take over the burden of financing training, particularly if he wants apprentices to become adept in a specific set of skills which are peculiarly useful to him.

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How valuable are the many types of formal training programs in shaping a work force which is sufficiently mobile and productive to adapt to the changing needs of our economy? It depends upon the craft involved, according to the next study.

FOLLOW-UP STUDY ON MOBILITY IN EIGHT CRAFTS

Carl Schramm

This research was designed to measure the effect of training on occupational and the internal economic rates of return. Included in the study are data from 2,125 males who completed one of six types of training programs; approximately 171 of the total number, or 8 percent, were completers of apprenticeship programs.

In order to determine how training affects lifetime earnings of the apprentices in the sample, the researcher calculated the difference between the wages received by operatives and craftsmen from the time training was completed until 65, plus the difference between their respective earnings for the period of time the apprentice was in training. No direct cost of training for the apprentice is assumed.

Rates of return for light apprenticeable crafts were computed where sample sizes of 150 or more were available in the age ranges from 18 to 65. The crafts considered were: carpenters, painters, bricklayers, operating engineers, electricians, linesmen, machinists and plumbers.

Income figures were arrived at under three different assumptions, as follows:

Assumption 1. Rates based on the average work year (This varies markedly by craft).

Assumption 2. Working less than a full year may, in part, reflect a decision by the worker to "purchase" more leisure. Where this obtains, leisure is given a dollar value as a return to training.

Assumption 3. The worker values leisure at somewhat less than full working time, and elects to take unemployment insurance to make up part of the electively lost income. This is the compromise, or middle position, and $40.00 weekly is taken as the unemployment benefit received by craftsmen while out of work.

Pre and post-tax rates of return were calculated for each of the aforementioned trades under the three assumptions stated above.

In some cases, there were no costs of training, since the apprentice wages surpassed the operative's wage even during training; thus, any income greater than that earned by the operative at a time following training is an "infinite" return to training. Electricians, linemen and machinists all were found to have infinitely positive rates of return. This does not hold for the other occupations, however. Carpenters and painters (under all three assumptions), bricklayers (under assumption 1 and 3) and operating engineers (under assumption 1) have infinitely negative rates of return. The reason: they made less money than the operatives both during and after training and therefore all of the investment

they made in training yielded no return in the form of future income (that is, versus what they would have made had they merely been inoperatives).

Plumbers (under all three assumptions), bricklayers and operating engineers (under assumption 2) and operating engineers (under assumption 3) experienced measurable positive rates of return from training. There are "classic" investment cases, e.g., apprentices earned less than comparable operatives during the training period but measurably more after training, and this condition continued throughout their working lives.

In sum, apprenticeship, as an investment decision is a wise course to follow under all three assumptions for electricians, linemen and machinists; for plumbers, bricklayers and operating engineers, returns are more limited, under certain assumptions; for carpenters and painters, apprenticeship appears to be a losing proposition.

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A more sanguine assessment of the effect of formal training on mobility is offered in this nine-state study of the construction industry, which, further, suggests ways to swell the ranks of minority journeymen within the building industry.

NINE STATE FOLLOW-UP IN THE CONSTRUCTION CRAFTS

Ray Marshall

The primary purpose of this study was to compare apprentice-trained journeymen with those who were informally trained, to determine whether the apprenticeship background affords a discernible advantage in consistency of employment, earnings and upward mobility. Secondarily, the research undertook to determine how and where informally-trained journeymen acquire sufficient craft skills to be accepted into the unionized sector.

The research was carried out in nine (9) cities (Atlanta, Austin, Chicago, Columbus, Houston, Jackson, New York, Oakland), and encompassed a representative group of construction crafts (bricklaying, carpentry, electrical work, ironwork, plumbing and steamfitting, sheet metalwork). Objective evidence was gleaned from fringe benefit records and over twelve hundred (1,200) interviews with journeymen, union officials, contractors and others with experience in and knowledge of

the construction industry.

Findings indicate that apprentice graduates enjoy a substantial advantage over their informally trained brothers in hours worked (this was true in 32 of 41 local jurisdictions) and they advance to supervisory positions in shorter time periods.

Although increasing emphasis has been put on apprenticeship training since the 1950's as the best means for turning out a cadre of competent all-around craftsmen (49% of the journeymen interviewed for the study were apprentice graduates), a number of factors make it unlikely that apprenticeship will ever be the exclusive means of entry:

1. Informally-trained craftsmen constitute a substantial portion of the available work-force in the construction industry, and unions have to organize them to protect their respective jurisdictions.

2. There is a continuing need for flexibility in the admissions and permit and travelling card systems to allow the industry to adjust to changing, seasonal demands.

It was noted, moreover, that the researchers found informal means are now important ports of entry for minorities into the craft trades. Some of the sources of informal training are: open shops in the industry, experience as laborers or helpers on construction jobs, vocational schools, the military, work experience in other industries. In fact, the only craft in which greater numbers of minorities enter via apprenticeship than the informal routes is sheetmetal working.

A broad-stroke comparison between the characteristics of apprentice-trained and informally-trained journeymen reveals that those who serve apprenticeships are a) younger, b) better educated, c) more likely to have friends or relatives in the industry and in the particular trade.

Entry requirements for the construction crafts seem to have been strengthened in the past few years, but in any case they vary from craft to craft, locale to locale, and depend in large measure on market conditions. On the whole, they are more stringent and more uniformly enforced for apprentices than for those seeking direct admission.

Discussion and Recommendations

Although hours worked is not a complete measure of the value placed on an individual because of his skill, the researchers believe it is the most objective calculation available; nonetheless, some weight is given to other factors (e.g. having friends or relatives in the industry).

In sum, the findings indicate:

1) The apprenticeship system, with its theoretical and rational underpinning is sound, and should be expanded and improved.

2) Provision should be made to encourage and help informally trained journeymen to update and upgrade their skills, so that they may reach the standards set by apprenticeship graduates.

3) Unions in the construction trades ought to do a more vigorous job of organizing the non-union sector to ensure good, basic training in the building crafts. (This research reaffirms the findings of a study cited earlier (Foster) that employers in the non-union sector appear to be more interested in turning out specialists than all-around craftsmen.) Such an effort will increase productivity and allow for more efficient utilization of the construction labor force.

4) Although minority participation in apprenticeship programs is rising steadily in the construction crafts, assuring that, eventually, there will be black journeymen, blacks are now underrepresented at the journeyman level. One way to begin to correct the current deficiency is to extend the Outreach concept to journeymen. One source of potential journeymen is laborers and helpers in non-union shops.

5) A concerted effort should be made to "regularize" the supply/demand cycle, in order to reduce the drastic periodic unemployment rate in construction. Since few workers in the industry have job rights, better management techniques are needed, and could be fostered by unions in two ways: 1) by working for annual employment guarantees, and 2) by bringing pressure to bear on government to maintain full employment.

6) Create a National Journeymen's Standards Board to protect the public interest by 1) approving national standards by craft, allowing for adaptation to local standards, and 2) including an appeals mechanism for individuals to grieve admissions they feel have been unjustly denied. (Administration of the appeals board would reside with a tripartite board consisting of representatives of unions, employers and the public.

7) Because of the prevailing bias against manual work in our society, a joint effort should be made by public agencies, unions, employers and educational institutions to combat existing stereotypes, and, simultaneously, to mount a campaign to attract talented young people to the construction industry.

8) A more efficient system of maintaining apprenticeship records should be devised to ensure data retrieval.

9) Governments should provide adequate financial support for programs which are not directly beneficial to employers and unions (e.g., Outreach for journeymen, Journeymen's Standards and Appeals Board).

10) Whether or not any or all of the above proposals are adopted there should be continuous, rigorous enforcement of anti-discrimination laws by governments.

CHAPTER III

APPRENTICESHIP AND MINORITIES

It is a comment on the slowness of change that the Spero and Harris study of The Black Worker, first published in 1931, should have relevance in 1973:

> . . .The essence of [the change in Negro's relation to industry] has been the shifting of the Negro's position from that of a labor reserve to a regular element in the labor force of nearly every basic industry. It has brought the Negro face to face with the problems of working conditions, which, though they may contain many special elements, are essentially the same as the problems of other workers. They are consequently problems with which the Negro cannot cope successfully without the cooperation of his white fellow workers. Yet ever since the rise to power of the American Federation of Labor both sides have raised obstacles to the consummation of such cooperation. Of all these obstacles none probably has been greater than the narrow and exclusive craft structure. . .of American trade unionism.[1]

According to the Report of the Task Force on New Initiatives in Apprenticeship,[2] the situation is just now beginning to turn around:

> Minority representation in federally registered apprenticeship has increased remarkably since DOL began applying significant staff efforts to EEO and compliance in apprenticeship. As of January 1968, 6.0 percent of all apprentices in the Federally Serviced Workload were minorities, while as of December, 1972, 14.4 percent were minorities. In addition, 17.2 percent of those entering apprenticeship as of December 1972 were minorities.[3]

Clearly, however, much remains to be done if job opportunities are to be available for blacks in the skilled trades on the same basis as they are for whites.

Five of the six studies in this section assess the state of blacks and apprenticeship.

1/ Sterling D. Spero and Abram L. Harris, The Black Worker (New York: Atheneum, 1968), p. 461.

2/ Manpower Administration, U.S. Dept. of Labor, Report of Task Force on New Initiatives in Apprenticeship (Washington, D.C.: August 3, 1973) duplicated.

3/ Ibid., introduction, 1b.

Dennis Derryck explores retention/dropout rates in Apprenticeship Outreach Programs in four cities, and he concludes that only after a minority apprentice is past the watershed of his second year, when his earnings and status rise appreciably, can there be an abatement of close counseling and day-to-day help.

Ernest Green discusses the structure of a model outreach program developed by Recruitment and Training Program, Inc., and he explains RTP's method for successful identification, placement and retention of minority youth in skilled craft apprenticeship programs.

A critique of current practices in the organization, administration, structure and implementation of apprenticeship programs in the construction industry is offered by Napoleon B. Johnson, particularly as they affect minorities.

Herbert Northrup and Steven Schneiderman's research finds minority participation in the construction crafts noticeably on the rise, not only in the apprenticeship stages, but extending to journeymen as well.

A strong case for encouragement of voluntary training programs in the construction industry is set forth by Richard Rowan, whose study indicates that flexible alternative training in "home town" plans leading to journeyman status broadens opportunity for minority recruitment.

The sixth presentation in this section concerns a new industrial minority--women. Charles Nye and Norma Briggs report on the manifold difficulties in widening apprenticeship opportunities for women in Wisconsin, and report the activities of the Wisconsin Apprenticeship Agency in affecting change.

IMPROVING RETENTION RATES IN APPRENTICESHIP OUTREACH PROGRAMS

Dennis Derryck

The thrust of this research is to investigate: 1) why minority apprentices remain in or drop out of training programs in the construction industry; and 2) the role played by staffs of AOPs in trying to minimize the dropout rate.

Data for this study were gathered by interviewing 261 active and inactive apprentices, 52 Joint Apprenticeship Coordinators, and the staffs of Apprenticeship Outreach Programs in Cleveland, Dallas, Denver and Philadelphia. It appears that a variety of factors operate to discourage minority apprentices from remaining in their program: discrimination because of race; customs and traditions of the industry (which, among other things, carries with it a system akin to fraternity hazing, replete with low status, assignment of meaningless tasks and disproportionate work loads, and the offhand manner in which on-the-job training is given); inadequate beginning apprenticeship wages. But far and away the most critical factor is the absence of a structured policy for retention.

The greatest stumbling block for retention appears to be the somewhat tenuous relationship between the unions via the Joint Apprenticeship Coordinators, and the Outreach staffs, with the former having virtual control over the terms and conditions of apprenticeship. The most direct link Outreach has with apprentices is through the JAC coordinator who may--or may not--communicate the necessity for special effort with an individual until a crisis has arisen.

Statistics show that in a majority of cases, Outreach is "too little and too late" to prevent dropouts.

In the early days of anti-discrimination legislation, an assumption was made that once the barriers to minority entrance into apprenticeship were removed, retention would be automatic. It is the contention of this research that a different set of factors obtain for retention than for placement. While unions are accepting of blacks and other minorities in the apprentice role, they are still resistant to granting craftsman status to minorities, lest the customs, traditions and social underpinnings of the union be diluted or lost.

Discussion and Recommendations

Outreach is most successful when it takes an active advocacy role, solicits feedback from the apprentices themselves, and calls into play the necessary government enforcement agencies when the situation demands it. Illustrative of this point are the markedly different results in the city of Cleveland, with an aggressive Outreach staff (comparatively high retention rate), and the city of Dallas, where Outreach "is totally beholden to the JACs" (low retention rate).

A comparison of white and minority dropout rates is difficult, the research suggests, because there are factors peculiar to each group which would distort the results. For example, many white youths drop out of apprenticeship programs in construction "because they don't like the work"; this does not appear to be true for black youths, who are "turned off" by racial discrimination and exclusion from the fraternity. Too, white youths receive support from friends and relatives in the trade or industry; black youths are disadvantaged by the absence of friends and relatives in the trade or industry. White youths may find themselves discriminated against because of life style; black youths are discriminated against because of color.

Seasonal conditions in the construction labor market appear to have some effect on retention rates. Although sufficient data are unavailable to substantiate this, information from the Cleveland portion of the study indicates that when the unemployment rate in that city is high, retention rate for minority apprentices swings upward, making it possible to speculate that apprentices might be more likely to remain where they are when their options are curtailed. (Other research reports in this volume were unable to find a relationship between unemployment and retention rates, however.)

In recognition that change, if it occurs, comes slowly, the recommendations emanating from the research cover three different sets of circumstances.

A. Assuming "no change" in the resistance to minorities in the unionized sector of the construction industry, it is recommended that:

1. Governments implement antidiscrimination legislation actively, forcefully and continuously.
2. Attempts be made to use alternate routes of entry for minorities, in addition to apprenticeship.
3. Minority man-hour goals should be replaced with an enforceable "retention quotient," with the number of new minority union members as the ultimate criterion of success.

Under this reality, Outreach staffs would operate much as they do now.

Assuming "marginal change," it is recommended that:

1. A strong support system be erected for apprentices, combining the energies and talents of all personnel associated with the apprenticeship system--shop stewards, job supervisors, business agents, journeymen, related classroom instructors, plus Outreach staff--to identify and act on individual and group problems related to the work environment, and to find journeymen who can assist in minimizing them. Increased effort should be made to broaden orientation programs for apprentices so that they may become acquainted with customs and traditions of the union, in particular, and the industry in general.

2. Outreach staffs should act as advocates for apprentices in such matters as improving technical assistance on the job, job placement, improvement of on-site working conditions. In addition, Outreach should make a concerted effort to bring back into training programs apprentices who have dropped out. These added responsibilities probably will necessitate augmenting present Outreach staffs.

B. Assuming "ideal change," i.e., maximum attempts made by unions, management and Outreach staffs to place, train and retain all apprentices it is recommended that:

1. Low beginning wage levels should be increased for all apprentices.
2. The training process should be revised and revamped to allow for: greater flexibility (accelerated training, self-pacing, steps in skill recognition which would allow entry at various stages of apprenticeship, broader preparation to include related skills); more modern training techniques; better coordination between related classroom instruction and on-the-job training.

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The Outreach concept can work, and work well, according to the next research, providing it is geared to serve as buffer, motivator, friend and policeman to guard the interests of participating minority members.

R.T.P.--A MODEL FOR APPRENTICESHIP TRAINING

Ernest Green

Minority participation in construction apprenticeship programs has increased dramatically since 1967 in large measure because of the Outreach concept. Between 1967 and 1972, over 18,000 minority indentures have been placed in the construction crafts, with the largest representations among bricklayers (1,128), carpenters (4,949), cement masons (1,027), electricians (2,647), iron workers (1,304), operating engineers (1,462), painters (1,800), pipe trades (2,216), roofers (959), sheet metal workers (1,197). At present, minority youth represent 18 percent of all registered apprentices in the construction industry.

Recruitment and Training Program, Inc. (RTP)* is an organization whose Outreach programs frequently are used as models for other, similar efforts.

Although RTP believes there is considerable room for improvement in the structure and administration of apprenticeship programs, it considers the apprenticeship route the best source of entrée to the elite mechanical trades for minorities, as well as a means of producing a "cadre of superior craftsmen" who are more versatile, and more upwardly mobile than others in the crafts with less formal training.

To prepare minority recruits for apprenticeship, RTP trains and tutors them for entry, teaching them, among other things, how to take--and pass--fairly administered tests (with tutoring, 73% of RTP's recruits score higher than others without preparation), and it guides and prepares them to hurdle the subjective oral interviews which in the past frequently served to bar minority applicants. Once RTP recruits have entered an apprenticeship program, the organization serves as their advocate while continuing to perform tutoring and training services.

RTP has also been active in new and innovative experiments in the construction industry: it has recruited journeymen and trainees for voluntary or "home-town" plans; it has recently concluded an agreement with the elevator construction industry to recruit minorities and it will also assist in the preparation of tests and selection procedures for elevator mechanics.

Although some critics of the Outreach concept say that the programs under "outreach" aegis are too costly, RTP's placement cost is $1,028.00 per apprentice--"far lower than any other Federal manpower program."

Critics have also charged that Outreach places apprentices in crafts that always have had high minority representation. There appears to be some justification for this criticism, but there seems to be considerable variation in the quality of placement, depending on the Outreach organization. For example, 45 percent of all of RTP's placements have been in the five elite mechanical trades--electrical, sheet metal, ironworking, pipe trades and elevator construction, where formerly there was little or no minority participation.

The fewest placements have been in programs sponsored by local building trades councils, where it is difficult to challenge unfair admissions policies, and where the tutorial programs are markedly weaker. On the whole, RTP finds that apprenticeship programs sponsored by international unions hold up better than local programs, because they are better-administered and less subject to pressure.

Discussion and Recommendations

The follow-up activity used by RTP includes development of a "core organization" to which apprentices can belong. Here, in a social setting, the most talented apprentices help the weaker ones with related instruction studies. In addition, one or more of the RTP staff spends full time keeping track of apprentices; counseling is continuous, and the apprentice is urged to visit the RTP office whenever he or she has a problem, whether it is personal or job related.

RTP has also broadened its scope to recruit about 1,000 minority journeymen over the past two years. (Some have been walk-ins who read newspaper accounts of RTP's success with apprenticeship placement.) On the whole, however, minority journeymen are difficult to find, because many of them are "probably enjoying some employment" though it is most likely in the non-union sector. The journeyman who is recruited by RTP is assured of a job, and the union credentials to go along with it.

The research strongly suggests that both facets of the RTP model--apprenticeship and retraining journeymen--can be used productively to change racial employment patterns in industries other than construction. Currently, the agency is experimenting in several areas; they are working with the International Firefighters to prepare minority recruits for Civil Service Examinations; a program has been undertaken with the Department of Labor to recruit and prepare minority women for white collar jobs in Houston; minorities are being readied to enter the ship-building industry in Pascagoola, Mississippi.

Additionally, there are indications that Outreach should be extended to recruitment and placement of minority journeymen, whether formally or informally trained. This will require the assistance of those agencies charged with enforcing anti-discrimination laws to a greater extent than is necessary for apprenticeship programs, since the bias against blacks is greatest at the journeyman level.

Finally, the research indicates that a strong structure should be developed for retention of apprentices. In all probability, this will necessitate enlarging Outreach staffs.

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Dovetailing with the previous reports, the critique which follows seeks to introduce change in the apprenticeship system, so that it can become more responsive to minorities.

ADDITIONAL LESSONS FROM ACTIVE RECRUITING AND TRAINING PROGRAMS

Napoleon B. Johnson

This report critiques some current practices in the organization, administration, structure and implementation of apprenticeship programs in the construction industry, particularly as they affect minorities.

Four major areas of apprenticeship training are scrutinized: pre-apprentice programs; administration and financing; the selection process, including recruitment and retention; and the training process itself.

Pre-Apprentice

Introduction to the basic skills required in the construction crafts prior to actual apprenticeship is desirable. Some of these programs, however, are inherently flawed in that they take a long period of time (nine months) during which the pre-apprentice receives no income; moreover, they are usually given during the day which precludes or at least severely curtails earning while learning. This works an especial hardship on minorities, and effectively restricts their use of pre-apprentice programs.

Administration and Financing of Apprentice Programs

A. Administration

It is the view of this report that too frequently, the Joint Apprenticeship Committees, whether administered by unions or management, become pawns of the collective bargaining agreement, and disagreements arising thereunder. Although it is acknowledged that separating apprenticeship activities from the bargaining process is a difficult feat, it may be possible to lessen the impact of the bargaining table on apprenticeship by requiring that no member of the JACs may serve on their respective negotiating committees.

B. Financing

Neither of the two basic concepts of financing--i.e., an industry training fund, or a union training fund--addresses itself to the need of the apprentice, and the financial burden he must bear during the training period. Instead "one or the other" aspect of funding may serve either 1) to prevent the non-contributing party from exercising judgment in how the funds should be expended, or conversely, 2) it might cause the non-contributor to be caprious about how to spend the money.

In any case, it would appear that the most equitable arrangement would be for unions and management to contribute funds for training jointly, with a third partner--the BAT--added in the case of federally registered programs.

Selection, Recruitment, Retention

Title 29, CFR Part 30, requires that each registered apprenticeship program developed an "affirmative action" plan to attract minority recruits. The report suggests that the minority community could offer important guidance on how to implement an affirmative action program; but in order to make it possible for the minority community to provide input an extensive program in public information should be undertaken.

Noting that grievances may arise among minorities because of some of the more subjective aspects of the selection process (in particular, the oral interview), the report strongly urges the creation of a tripartite "appeals" committee with final and binding powers, composed of one member each from labor and management, neither of whom could be a representative to the particular program's JAC, plus a public member preferably from the minority community. The sole concern of the committee would be to decide whether discriminatory treatment prevented an individual's selection as an apprentice.

The Training Process

As it is presently conceived, the report finds the training period, and the nature of the training insufficient "to create an 'all-around journeyman'" but overlong "to create a journeyman who can adequately meet the demands the industry will place on his skills."

The research suggests that more attention should be paid to how classroom and on-the-job training are administered to new apprentices throughout the training process, in order to maximize the effects of the learning procedures. Specifically, it is recommended that the first three to four months be spent in a combination of classroom and shop instruction; followed by six months on a job; he or she would then return again to the classroom and shop for six to eight weeks, after which another return to a job site. The report argues that this approach allows for the development of well-grounded craftsmen.

During periods of institutional training it is noted, the apprentice will have no earning capacity. The report recommends, therefore, that some type of subsidization from BATs be made available to apprentices trained under this procedure.

Implications

1. Pre-apprenticeship programs should be encouraged, but some method must be found to give financial aid to minorities who cannot afford to be without an income for this phase of the training period.

2. Members of JACs ought not be permitted to participate in the negotiations of collective bargaining agreements, nor should apprenticeship programs suffer because of traditional management/union conflicts.

3. Financing of apprenticeship programs should be borne jointly by labor and management, with BAT offering financial assistance to federally-registered programs. This will require that Congress pass enabling legislation.

4. A program of public information should be conducted by the Federal Government aimed particularly at informing minority communities about apprenticeship programs.

5. An "appeals committee" should be created for each program which would enable recruits to register grievances concerning perceived discriminatory treatment in the selection process. Tripartite in nature, each committee should have a representative of labor, a representative of management, and a public member.

Labor and management representatives could not be members of the program's JAC.

6. The training process should be redesigned so that classroom and shop training are followed, at regular intervals, with on-the-job training. To enable an apprentice to shift from income-producing to non-income producing components, BAT should be given funds by Congress for this purpose.

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There is a move toward greater equality between whites and minorities in certain crafts which formerly were restricted to all-white or all-black workers, says this research undertaking.

MINORITY IMPROVEMENT IN APPRENTICESHIP PARTICIPATION IN CONSTRUCTION TRADES

Herbert Northrup and Steven Schneiderman

The goal of this research is to measure the rate of integration in skilled trades apprenticeship programs.

The primary measurement tool is an index of integration computed from a combination of minority and non-minority apprentices over time in each of nine trades and in relation to the total number of all apprentices in the skilled trades. The index of integration is the ratio of minority to non-minority average rates of change over a specified time interval (January 1, 1968 to June 30, 1972, with data from Federally serviced workload on apprenticeship programs).

The researchers maintain that the general trend of the values of the integration index are more important than the actual values of the index, since the thrust of public program efforts was to change the trend rather than the actual numerical values of the index.

For purposes of the study, crafts are divided into three groups:

Group 1. Non-minority intensive, i.e., the white relative distribution is greater than the minority distribution in the craft. This group is comprised of: electricians, pipestradesmen, ironworkers and sheet metal workers. The study shows that the tendency is toward an equal distribution of whites and minorities. These traditionally exclusive trades have made significant apprenticeship opportunities available to minorities over the five-year period under study--a result of the increase in the total number of apprenticeship slots in these occupations, plus the fact that minority apprentices in the trades have increased at a faster rate than have white apprentices.

Group 2. Minority intensive,* i.e., the minority relative distribution is greater than the white distribution in the craft. This group is comprised of trowel tradesmen and roofers. Historically, there has always been a disproportionate number of minorities in these trades, but over the time period studied, these, too, appear to be coming more to an equal relative distribution of minorities and whites. It should be noted, however, that the total number of apprentices in these crafts has decreased over the time period studied, and minority participation has decreased at a more rapid pace than white participation. The overall result is a move toward "equality" as in Group 1.

Group 3. Those trades which do not fit either of the above classifications. This group is comprised of carpenters, painters and glaziers, but each operates as a result of a different set of factors:

a. Glaziers began as a "minority intensive" trade, then changed to non-minority intensive and now appear to be proceeding toward equal distribution.

b. Carpenters began as a "minority intensive" trade and the status quo is being preserved because minority and white participation are increasing at approximately the same rate.

c. Painters were "minority intensive" and are remaining so because the minority distribution is increasing while the white distribution is decreasing.

When a trade is expanding its apprentices (as with the Group 1 crafts above), then it appears minorities tend to become more equitably represented. When the trade is attracting fewer apprentices, then the trend appears to favor whites. Yet, as one looks at Group 3 crafts, contraction appears to favor minorities, so that it is difficult if not impossible to generalize on the basis of the research. Nonetheless, the evidence presented indicates that there is a general move toward greater equality in those crafts which have previously been classified as predominantly black or predominantly white.

Nonetheless, the authors acknowledge that the informal routes to journeyman status are not utilized by minorities, and therefore, this analysis may not, in fact, present an accurate picture of the number and distribution at the level of journeyman in the occupations studied.

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* The term is confusing. "Minority intensiveness" does not necessarily mean that there are greater numbers of minorities than non-minorities in specific crafts mentioned, but rather that minorities are represented in greater proportion than in all the apprenticeable trades considered in the study.

In this research, voluntary or "hometown" plans are seen as helping broaden minority representation in the construction industry at a realistic rate, thus giving those trained under them a good opportunity for employment upon course completion.

ALTERNATIVE ROUTES TO SKILL: VOLUNTARY PROGRAMS IN THE CONSTRUCTION INDUSTRY

Richard Rowan

Effectiveness of voluntary, or "hometown" plans is compared to imposed plans for increased minority employment in the construction industry, with special reference to the Indianapolis experience.

Background on voluntary plans indicate that they have two unique characteristics:

1. Tripartite administration, including representation by concerned unions and managements, plus a coalition of public members selected from the minority community. In the typical organizational design, the Organizational Committee of the Plan is composed of four members of the community coalition (all of whom are on the paid staff of the Plan), plus two union members and two employer representatives.

2. Voluntary plans have introduced an alternative training route--known as the "trainee system"--for minorities who do not want to take, or cannot qualify for, regular apprenticeship training. While the "trainees" walk a road parallel to apprentices--i.e., receive similar wages and benefits, on-the-job training, and related instruction--the Plan operates a separate training facility for them, and assumes most of the responsibility for their related instruction and qualifying them for advancement. Upgrading has three steps--"trainee," which is the beginning point, lasts anywhere from six months to a year, depending on how the Operations Committee evaluates the progress made; "advanced trainee," which is equivalent to 2nd 3rd or 4th year of apprenticeship training; and finally, journeyman. Some recruits are placed into the "advanced trainee" category upon entry, if they have had a minimum of two years' work experience in the craft. No time limit is specified for either of the two "trainee" categories, but while journeyman status may be reached relatively quickly (some pipe trades trainees have satisfied requirements in as little as two years), unions tend not to recognize the trainee-route journeyman until his apprentice counterpart reaches the same rank, even though the trainee may be paid the journeyman's wage. Equally difficult have been antagonisms between regular apprentices and trainees. These problems have led to a variation, pioneered in Denver, whereby trainees spend their first six months as described above, after which they are transferred laterally into regular apprenticeship programs, and absorbed into them.

Placements of minorities through the Indiana Plan as of September, 1972, included 64 journeymen, 119 apprentices, 52 advanced trainees and 325 trainees, for a total of 560. Of these, the retention rate was about one-third, despite efforts to select participants apparently interested in a career in the construction field, underscoring, once again, the need for an adequate policy that addresses itself to retention as well as placement of minorities.

The conditions and criteria for success of a voluntary plan based on the study of Indianapolis and the somewhat more limited experience in Denver are: a) favorable economic conditions and a good labor market for construction, b) the existence of a strong community coalition, c) favorable attitudes of employers and unions, d) the effectiveness of Federal officials, e) the efforts of local governments, and f) the historic participation of blacks in each of the crafts considered. Indianapolis, in all these respects offered a favorable laboratory, and chances for success were enhanced when absolute goals for minority participation were set at a realistic level.

Within the limited boundaries of the project and what is known about voluntary plans, generally, Dr. Rowan concludes that in the construction industry at least, voluntary plans are more advantageous than those imposed by governments, because: first, they give the private parties an opportunity to develop realistic goals they can reach (in enforced plans, for example, man-hour goals are predetermined for the employer); and second, because they offer a good chance that the minorities trained under a plan's auspices will become permanently attached to the craft.

Discussion and Recommendations

Voluntary training programs in the construction industry appear to prepare their students well, since trainees have little or no difficulty passing licensing tests in their respective crafts.

Advanced training status is sometimes granted on entry, after an evaluations committee looks at the recruit's experience and his supervisors' ratings, although admittedly, some of the criteria used by these committees are subjective.

The major difference between a regular apprenticeship program and the "trainee" program described above are the related instruction components. In the highly skilled crafts, voluntary plans do not have the experience to design curricula which are as good as those in traditional apprenticeship programs.

The implications for public policy turn, in the main, on assistance from the Office of Contract Compliance. The research concludes:

1. The Office of Contract Compliance must undertake better enforcement and monitoring of plans it approves. Past employment practices in the construction industry are sometimes difficult to alter, and there have been occasions when the parties have not lived up to the spirit and letter of their agreements. A voluntary plan with no enforcement mechanism is just as ineffective as an imposed plan with no voluntary cooperation by the parties.
2. The Office of Contract Compliance should offer "constructive assistance" to those undertaking voluntary plans, not the least of which ought to be reasonable assurance that any given plan will be allowed to continue as long as its provisions are respected by the parties. The current atmosphere of uncertainty is neither conducive to good planning, nor good administration.

3. Finally, it is suggested that longitudinal studies of plan recruits be undertaken with an eye to formulation of a definite retention policy. Parallel studies should also be initiated in the non-union sector.

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As short a time as a decade ago, the term "minority" or "disadvantaged" workers were euphemisms for black males. The passage of the Civil Rights Act of 1964 broadened the emphasis to include a host of others who are discriminated against in the world of work, including women, who are the subjects of the final study in this section.

WOMEN IN APPRENTICESHIP

Charles Nye and Norma Briggs

As practitioner and researcher, Charles Nye, Director of Apprenticeship in Wisconsin, and his co-worker, Norma Briggs, explored the obstacles to full utilization of women as skilled workers and apprentices, and they tried to develop methods by which women may be brought into skilled craft apprenticeship programs.

Significantly, Wisconsin, where the research was carried out, was reported to have the highest number of women indentured in apprenticeship programs (one-third of the national total). Close examination revealed that while this estimate is correct, 94% of all female apprentices in the State are in cosmetology programs, and the remaining 6% are registered in other "typically female occupations."

The researchers found the most pervasive obstacles to female participation in apprenticeship and other skill programs to be "myths and sex stereotypes," which affect employers, unions, and extend to apprenticeship administrators--e.g., the research project staff, the State Apprenticeship Agency--and to possible women recruits, as well. Moreover, the literature, including material used by the Wisconsin Department of Instruction, sections of some labor contracts, and the Dictionary of Occupational Titles all tend to perpetuate myths about women by, among other things, downgrading female skill abilities and relegating women's occupational choices to menial or "dead-end" jobs.

Time and circumstances (a depressed job market in Wisconsin when the project was under way) prevented actual breakthroughs in placement. Nonetheless, some progress was made: with the aid of the Center for Family Studies at the State University, the project staff was "sensitized" to stereotyped attitudes

about women; the language of the State's Affirmative Action Plan was revised to include special provisions for women; career instruction materials used by the public schools were amended and changed; a film, "Never Underestimate the Power of Women" was made to show women performing successfully in non-stereotyped jobs, and it was shown at schools and at other public gatherings; meetings were held with State industrial and labor leaders to discuss the constructive work women can play in the crafts.

Discussion and Recommendations

Unlike agencies in many other states, the Wisconsin State Apprenticeship Agency eschews the advisory role (such as one finds in Massachusetts), and enters into the selection process directly. The Agency sponsors about 50% of the programs in the non-unionized construction sector, and Agency help is available to "any employer who has the facilities to train." Data are available from the Agency about apprenticeship programs in both union and non-union shops, by industry.

The research recommends that public policy address itself to the following:

1. Design and undertake a professional survey of high school students, high school teachers and counselors, to uncover gaps in information (or misinformation) about labor market limitations and opportunities for women. These data should be used to design a course curriculum for use, nationally, throughout the public school system.
2. Undertake a systematic review of the office and program procedures of public and private agencies and institutions charged with the delivery of job market information and services, to correct sex biases in written material and in direct personal contacts with clients.
3. The Department of Labor should undertake a promotional campaign to promote industry-wide correction of discriminatory language and to discourage discriminatory contract interpretation.
4. Seek to institute "career ladders" in the health field, which has a high female worker population, to provide upward mobility. One method would be to require facilities receiving state, county, municipal or federal funds to institute training programs.
5. Provide opportunities for female inmates of correctional institutions to participate in apprenticeship or other skill training programs during their incarceration. (This practice exists for male prisoners in Wisconsin's State prison system.)

CHAPTER IV

TRAINING DATA AND MANPOWER PLANNING

If the United States is to use its manpower resources effectively, it needs to know a) the requirements of the labor market at any given time, and b) whether those requirements can be satisfied. But accurate information about training practice is in very short supply.

Of major importance in developing a model for manpower planning and administration is the knowledge that labor market action, by and large, is at the local level; save for relatively few professional occupations and a handful of selected crafts, the tricky process of matching jobs and people takes place in narrowly defined geographical areas.

Training, without a reasonable prospect for a job following the period of indenture, amounts to so much "busy work"; training for specific market needs, on the other hand, serves the objectives of public policy--to maintain a high level of employment with jobs for all of the citizenry who can work.

The two reports which comprise this section deal with methods of manpower data collection, retrieval and dissemination to improve our delivery system.

Neil Rosenthal reports on a pilot study in data collection methods undertaken by the Bureau of Labor Statistics.

Edwin A. Markowitz and D. Quinn Mills see data collection and dissemination of labor market conditions in the construction industry as being vital forces in the stabilization of the work flow. A computerized information bank, mutually accessible to industry, governments and unions, and susceptible to analysis, they find, would allow for advanced manpower planning on the local level that is not now possible. Their brief report is presented here, in toto.

A PILOT STUDY OF TRAINING IN INDUSTRY

Neil Rosenthal

The BLS research project was a pilot study to determine the feasibility of collecting data about apprenticeship and other types of industrial training from employers in the metalworking and public utilities industries (electric power and telephone). Attempts were made to collect data for the calendar year 1970, to find out about various aspects of training--how much, what kind, the purpose, plus the number of enrollments and completions--in ten occupations.

Although the statistics developed as a result of the study are unreliable because of the small size of the sample and some faults in the questionnaire, some interesting insights into methodology resulted. A dual method of solici-

ting data was used. One was a standard mail survey to 470 establishments, with 150 of them selected for follow-up which consisted of a second questionnaire. The second technique involved a "diary" system which required the respondents to keep a weekly log. The sample for the diary approach was 50 employers from a different group than those covered by the mail survey.

Both survey methods elicited a high response rate; 65% or 306 mail questionnaires were returned; response was exceptional for the "diary" approach, between 88% and 89%. (The difficulty with the diary method is its high cost because of the need for personal visits by staff to explain how to use it.)

Discussion and Recommendations

Within the study, diary-approach employers reported a higher proportion of training. The researcher suggests that rather than viewing the results as disproportionate, the difference may be attributable to the fact that keeping a diary does not rely on recall to the same degree that a mail survey does.

Researchers on the whole tend to be wary of the validity of replies garnered in mail surveys. Because BLS shares some tentativeness about the kinds of responses mail inquiries bring, it cautions that to be valid, such replies must be continuously subjected to "an elaborate response analysis." Questionnaires used in mail surveys, moreover, must be designed so they are amenable to tabulation.

Occupations in the study showing the highest degree of training are (in descending order): instrument maker (metal working), electrical repairman, computer programmer.

Based on the response to this pilot study, the Bureau proposes another and more extensive research project to develop a nationwide sample of the kind of training that is going on in various industries. A questionnaire is in the process of being developed to broaden the area of inquiry, including such information as: what kind of selection process is used to identify recruits to programs? what skills are taught? what happens after training is completed? what are the characteristics of the training staff (e.g., are they people from inside or outside the organization)? what kinds of training facilities are used? how and what kind of records are kept? It is the Bureau's view that such information could be invaluable in determining present and future training needs throughout the United States.

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Automatic data processing equipment and techniques, says this next presentation, can prove beneficial to the construction industry providing: 1) employers and unions surmount the feelings of threat such sophisticated technology poses; 2) methods are found to expand the uses of data processing to include job characteristics; and 3) techniques are worked out to match jobs with workers.

A COMPUTERIZED LABOR MARKET INFORMATION SYSTEM AND ITS PLACE IN THE CONSTRUCTION INDUSTRY

Edwin A. Markowitz and D. Quinn Mills

Introduction

This paper presents some observations regarding the relationship between information and manpower problems in the construction industry acquired by the authors in the course of research into computer assisted labor market information systems for the construction industry. These conclusions are not quantitative; nor are we suggesting that a given amount of effort invested in computer-assisted information systems in construction will have some particular corresponding effect. It would be premature to make such claims. Rather, we hope that the presentation of these views will stimulate interest in the construction industry of the potential availability of better information resources and of the essential involvement of computers in making these information resources available. We will discuss three topics. First, the framework of our research into computerized labor market information systems in construction. Second, manpower problems and information and third, possibilities for future development.

Research Framework

Three important new efforts are going on with respect to information in the construction industry, two of which involve the government.

First, the Construction Industry Stabilization Committee has established a computerized bank of wage data. This data bank contains current and historical data on the wage rates and fringe benefits of members of construction industry local unions, and also data on the size and jurisdiction of local and upon bargaining structure. Since this information is computerized, it is available for fast statistical analysis by machine. This is the first time so much information regarding collective bargaining in construction has been brought together in one place. The data system as a whole serves in the administration of the economic stabilization program, and items of information are made available to the industry in various ways.

The second information effort is being undertaken independently by various national unions which are computerizing membership records and, in some cases, the records of national pension funds. This process requires making information about each of the national unions' members available for machine processing, and cataloguing such information as local union affiliation, age, skills and other items. Since such record keeping entails recording the turnover in local membership, it can provide one measure of worker mobility in the industry. As with the CISC data bank, this information is available for computer analysis, but this is usually done only at the elementary level of certain summary statistics (such as membership totals). Organizations pursuing this kind of effort are the Bricklayers, Masons and Plasterers, International Union (BMPIU), The International Brotherhood of Electrical Workers (IBEW), the

United Association of Plumbers and Steamfitters (UA) and the Ironworkers (BSOIW).

The third group of informational efforts are those sponsored by the Manpower Administration Research Office. These efforts stem from a statement in 1970 by President Nixon directing the Secretary of Labor to develop a pilot construction labor market information system which would make maximum effective use of electronic data processing methods. These efforts are also directed at improving and extending information resources to the local level. The authors of this paper have been involved in this effort, as is described below.

The research from which this paper derives began as a year long feasibility study for a computerized LMIS for construction by Markowitz, Mills and Dunlop. Upon its completion in June of 1972, it was followed by an ongoing two year contract to experimentally implement some of the recommendations of the feasibility study. Certain basic insights that have emerged from this research differ substantially from those offered by other researchers, in that they suggest the principal source of data and the principal need for information to be at the local labor market level, rather than at the regional or national level.

Perhaps a fourth element should be added. Non-union contractors are increasingly interested in multi-firm manpower information on a local labor market basis. Initiatives in this sector may also contribute to improving labor market information in construction. The very nascent status of these efforts prohibits their further discussion here. The need for the certain types of manpower information is real, and too time consuming or expensive to compile without computer assistance. Much information has been or is currently being compiled over a period of time in a few places with computer assistance. But these instances are few and isolated. Seldom are the participants aware of one another or of the potential returns on some marginal addition to their individual operation.

Thus, several important advances are currently under way in the development of computerized information systems in construction. Each advance is partially developed, and the three are as yet unrelated to each other. Together, however, they give evidence of a spirit of initiative and experimentation within the industry and in cooperation with the government in the development of more comprehensive informational systems. Further, they may provide, in the course of the coming decade, a substantial improvement in the information available about the construction labor market.

Manpower Problems and Information in the Local Unionized Construction Labor Market

The labor marketplace in the construction industry has always been a casual marketplace. Its casual nature was not planned but developed because demand for construction is variable and uncertain. In order to operate successfully, construction contractors have had to be flexible in the amount and kind of labor they employ. The mechanism by which this need is met has distinct long and short term aspects and is central to the relationship between union and contractor.

One major day-to-day function of the local union is to act as a job-

clearinghouse for the labor force in a trade. Contractors needing men contact the union's business agent for referrals of men with skills they need. Out of work union members contact the business agent in order to see if there is work and to make their availability known should work become available. In this way the large volume of job turnover is hopefully handled efficiently.

Although much job referral is done by work-of-mouth, or in some areas by a strictly formal reporting and priority dispatching hiring hall arrangement, most construction referral is done as described above. If any aid to the business agents memory is used at all, it is seldom more elaborate than a card index file. In such cases, there is usually no constraint beyond the business agent's judgment on the order in which referrals are made.

The drawbacks to such a referral mechanism are twofold. First, it can be inefficient. Simple lapses of memory can mean that a man will be unemployed longer than necessary. In small unions, business agents are often part-time and have other responsibilities. They may be hard to reach and communication delays ensue. In larger unions of a thousand members or more, the memory problem can be much more acute and the complexity of mechanical aids sometimes more of a hindrance than a help. Second, the completely discretionary referral powers of the business agent are subject to deliberate abuse. The possibility exists that unfavored individuals and groups will find themselves completely unserviced.

In light of these problems, there has recently been increasing interest in computerized job/man matching in construction. Such a mechanism, it is argued, would not ignore individuals or discriminate against them on non-job related criteria. There is hope that it would be faster. There are at least three possible forms such a system could take.

The first, the use of computer compiled out-of-work list by the business agent. For example, such a system is now being used in some local unions. The list categorizes all out-of-work members by their skills and orders them accordingly to their priority for referral. It is distributed to the unions' offices each day and consulted every time a referral is made.

The second form is the maintenance of the jobs available list. This is being done in many places by the Employment Security System as part of its computerized job bank program. For a number of reasons the ES effort has been unused by the construction locals and contractors. The most important reason is that it is slower than non-computer referral for the construction trades. It involves ES paperwork each time an individual registers to use the service. He must physically present himself at an ES office, and there is no continuity from visit to visit. Such a list is also more effort to compile since it deals with completely transitory job characteristics.

Finally, there is the possibility of maintaining both job and out-of-work lists and using a computer to find matches. To date, this has not been done in the construction industry. Apart from the programming difficulty, it has two less obvious drawbacks: in order to make immediate referrals it

requires the use of a more expensive on-line computer; second if the labor pool is properly balanced against construction demand, there will seldom be a large backlog of jobs waiting for men to fill them.

The long-term purpose of the relationship between union and contractor is to determine what the balance between the size of the labor pool is and how the balance is to be achieved. Both parties have reasons to prefer the expansion of labor sources in some instances and its restriction in others, but self-interest and a lack of a really effective way to find the balance often lead them to adversary positions.

For instance, contractors in general prefer the labor pool to be larger than the demand for construction actually warrants. In this way they are assured of enough skilled men even during temporary peaks. Specific contractors may wish to restrict the size of the labor force in order to keep their competitors from getting skilled men, but the only continuously operating negative influence is the contractor's unwillingness to pay for training. This can be expressed by contractors - and has been - "I'm more than happy to make use of all the apprentices <u>you</u> train."

On the other side, unions generally want to restrict the size of the labor pool - often below the size actually justified by the construction demand. In this way they hope to insure full employment even during construction slumps. Unions generally realize, however, that they must approximate construction demand fairly closely or face the prospect of builders going elsewhere and contractors seeking non-union labor.

To say that these attitudes reflect what are largely political considerations in the industry is perhaps to dismiss them too lightly. But one should still consider separately whether a proper balance between the size of the labor pool and the amount of construction can be achieved even with the full cooperation of all concerned. Full cooperation has seldom been forthcoming. Typically, consider that unions have historically insisted that the exact figures on their number of members and their skill breakdowns confidential information. This has partly been to discourage others from claiming that these figures do not support the proposition that the labor pool is large enough. Yet, there simply has not been any way to determine what the balance is. The traditional method of determining that the size of the labor force is too small is to discover that construction schedules are not being met. By then it is already costing somebody money. Even if immediate steps are taken, especially if an apprenticeship program is involved, by the time these steps have become effective, the construction picture may have changed again. The result can be a substantial number of unemployed men.

The problem then is recognizing a labor shortage before it is acute - and then deciding whether a permanent increase in the size of the labor force is warranted. While some level of apprenticeship training may always be necessary to replace losses in the labor force due to deaths, retirement, or simple relocation, apprenticeship programs to increase the number of skilled men available are not always the most appropriate response to a labor shortage. Apart from delays in obtaining skilled men that are due to friction in the referral process, there are three types of shortages due to upswings in labor demand.

The first type is caused by what might be called "predictable" upswings in labor demand. These occur when construction projects in the same region simultaneously require large numbers of men from the same trade. When this happens, the labor pool is temporarily exhausted although it may be under utilized for some time after the peak passes. The demand on the labor pool during this type of upswing becomes visible suddenly. However, in retrospect, it should be apparent that the situation approached slowly as independently administered construction projects approached parallel points in their building plans. These plans may not have paralleled previously, and may not again, but a properly placed observer might have foreseen the one time that they did parallel - and the accompanying in labor shortage.

The second type of labor shortage is caused by the seasonal upswing in labor demand. To minimize the change of time lost to bad weather, outdoor activities are usually scheduled for one "best" season by all contractors in a region. The resulting simultaneity may require more than one hundred per cent of the work force for that season, and may also lead to a seasonal expansion in the demand for labor in the indoor trades during the following months. Actually seasonal upswings are a special case of the previously described predictable upswings in the demand for construction labor. It is not nearly as difficult to predict, however, and it has been recognized as a separate problem in the literature on construction for some time now.

Finally, there are long term construction booms which radically alter the character of the demands made on the labor pool in a region. These reflect a basic change in the economy of a region. Such increased construction activity might be caused by the arrival of some new industry, as a computer manufacturing facility, or by the introduction of a massive urban renewal project. The building expansion that follows will probably last years and continue to need a pool of construction labor larger than is currently available.

It is in this last situation in which an expanded apprenticeship program is most appropriate. When a long term construction boom threatens to swamp the local labor force, clearly an increase in the size of the force on a long term basis is called for. In other situations, either the shortage can be ridden out as being transitory, or if there is time, travelling workers from neighboring regions can be imported to ease the crisis. On a haphazard basis this what is done now. But the penalty for the improper choice of response to a labor shortage can be severe.

If the labor pool is allowed to expand indefinitely through apprenticeship programs, eventually there will not be enough work for the skilled men available. But if a long term labor shortage is ignored or dealt with strictly on the basis of importing workers from elsewhere, there is a strong possibility that it will restrain the volume of construction as manpower delays increase in the cost of building and owners go elsewhere.

If we analyze apprenticeship programs in this fashion, two questions suggest themselves.

First, how can we be sure that the shortage is of a type for which an expanded or altered apprenticeship program is an appropriate response? This is an important question and difficulties in answering it are the main reason that rational balance between the amount of construction and the size of the work force has not been achieved earlier. We suggest that certain types of

computer assisted information go a long way toward providing the answer.

Second, if an expanded or altered apprenticeship program is decided on, in what time frame should it be implemented? Too many apprentices added to the labor force too soon is just as disruptive as any other kind of labor imbalance. We would suggest that here too, that computerized information systems offer real hope of improving the manpower process.

The Use of Computers

We now turn to the kind of information we expect to become available with computer assistance. Both to eliminate this vagueness and to demonstrate that computers can generate the information we have been referring to, the following experiences are reviewed for the reader. First, there was the development of the Building Industry Data System (BIDS). BIDS was developed at the Center for Architectural Research at Renssalaer Polytechnic Institute and funded by the State University Construction Fund (an agency of New York State). Perhaps the best succinct description of BIDS is that of its deputy general manager, Grover B. Tarbox:

> "BIDS is an effort designed to provide all segments of the building industry with information on current and future conditions in regional construction markets.
>
> The system was developed in recognition of the fact that many, if not most, of the participants in the construction marketplace have very little "feel" for the supply of resources available to build (manpower, management, materials), or for the demand that may be placed on those resources in months and years to come. . .
>
> To test and evaluate the effectiveness of an industry-wide information system such as BIDS, two pilot studies are in progress: (November 11, 1971).
>
> 1. BIDS is collecting and distributing project information in the Binghamton-Oneonta region of New York State. Since the pilot study was initiated in the summer of 1970, 1100 "users" have joined as contributors/receivers of data, and some 520 projects have been entered into the system. Project listings have been produced on a monthly basis since February,1971; estimates of the demand for construction labor have been published since July, 1971.
>
> 2. BIDS is collecting information on state agency projects in the planning and design stages in all regions of New York State, and beginning in June, 1971, has distributed this listing to all agencies involved, on a regular basis. The objective is to effect better interagency coordination of work."

Viewed strictly from the framework of apprenticeship planning, BIDS with its computer generated estimates of the manpower requirements in its covered region provides a basis for deciding what type of shortage is occurring. Clearly if the figures show that the demand for construction labor will exceed the supply only for a two week period in June an apprenticeship program is not indicated. Further, since these are forecasts available in advance of the actual labor shortage temporary measures can

be taken such as importing labor from other regions for that period of time so that no construction delay need actually occur.

If, on the other hand, the forecast is for a longer term data shortage the question of initiating an apprenticeship program to meet the need can can be more seriously considered. Of course long term forecasts become increasingly more unreliable, but the BIDS system also produced comprehensive listings of construction projects in the area which could be consulted to see if, in human judgment, there was evidence of an approaching construction boom. Sometimes a boom occurs literally overnight and no prior indications will be found, but in the majority of cases, long term labor forecasts and intelligent use of the construction listings could identify or predict real booms.

A second example of computer usuage involves Operating Engineers Local Union No. 3 in Northern California. Local 3 is the largest construction local in the country with a membership of approximately 37,000. Because of its extremely large size, the bulk of the local's records keeping have been computerized. This includes the record keeping for their apprenticeship program. Apprenticeship record keeping by itself is little use, but as carried by Local 3 it includes detailed current status records on each apprentice. Since these are machine readable they can be abstracted into a variety of statistical formats. To some extent this is done.

Unfortunately, to complete the example it is necessary to enter the realm of the possible rather than what is done. In theory, Local 3 has the ability to project the completion of apprenticeship and benchmark progress. The latter is done, but for accounting purposes rather than planning. It is not overly unrealistic to say that <u>if</u> Local 3 were to realize the full potential of its apprenticeship record keeping and to use it for planning purposes in conjunction with BIDS like information on construction demand, it would be able to regulate its role in the California construction industry such as to achieve a real balance in the long-term between the supply and demand for operating engineers.

<u>Other LMIS Possibilities</u>

In order that this paper be brief, we have confined it primarily to describing the potential for computerized job referral and demand projections. These in turn are aspects of general trends and possibilities in the development of computer information resources and their use. We close by briefly noting three of these.

First, increasing computer usage should make available quantitative information on the historical experience of local labor markets. With the availability of such information, we can expect local unions and employer associations to use it in their manpower planning process. This is the most important planning level in the industry.

Second, increasing computer usage should allow the national unions and employer associations to have detailed and continually updated information about manpower distributions and usage. From the CISC will also be available data on wages and collective bargaining. In the past national organizations have only been able to partially gather this kind of data and in many cases their

information was erroneous. With its widespread availability we can expect that the potential for the involvement of national organizations in assisting and coordinating their local units will increase enormously.

Finally, we can expect that the government will try to find some way to access these industry data and use them in developing more sophisticated means of recommending and evaluating manpower policy in construction. None of these developments can be expected tomorrow, however. Several years of effort are going to be required. It will also take close government cooperation with the industry. There is much work to be done and plenty of room for researchers to refine and add to the conclusions presented here.

CHAPTER V

LESSONS FROM FOREIGN EXPERIENCE WITH APPRENTICESHIP

Other countries of the world, particularly those whose roots extend into the ancient past, have developed an increasingly sturdy structure of support for the apprenticeship system; many have tied it firmly to the process of public education.

Although but a single report appears in this section, it should be noted that throughout the Conference, favorable allusions were made by other presentors to some aspects of foreign systems of apprenticehood. The study by Myron Roomkin investigates apprenticeship systems in Europe and Canada, and concludes that it is both possible and desirable to adapt some foreign practices to domestic use with beneficial consequences.

The purpose of this research was to review foreign experience in apprenticeship training and attempt to test whether some successful European innovations would find favor among employers, unions and governments in this country.

Europe has a long history of government involvement in apprenticeship training in one way or another. The English, Germans, Swiss, Italians, among others, have systems of payment to employers who institute apprentice programs; moreover, governments in those countries have set up agencies to coordinate apprenticeship training, upgrade and conduct research on important aspects of it. As a result, the Europeans have made inroads in improving the apprentice system with such innovations as modular training* (or training by stages), varying the length of programs (some last for two years, others for four, the former concentrating on the general skills, the latter on more specialized skills, with no stigma attached to the shorter route).

To test American reaction to the European approach, the researcher queried employers and union representatives in a section of Illinois. Two groups of employers in the Chicago metropolitan area were asked to fill out and return a mail questionnaire; the first group was drawn randomly from all identifiable businesses and was made up of about 1,000 firms stratified by industry and size; the second group was selected from the B.A.T. files. Thus, it was possible to get a response from those with no known history of apprenticeship involvement (Group 1) and measure it against those who used the apprenticeship system at some point. The total union response was gained through personal interviews.

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* See presentation by Dr. Arthur Oriel.

Although Roomkin reported "dismal" returns to the questionnaire, certain facts emerged. Not surprisingly, employers favored those innovations offering the greatest net economic inducement to training (i.e., direct cash subsidy over tax rebates). The level of response was greatest among those employers who had apprenticeship programs at one time or another, but dropped them because of cost; this group favored technical assistance by government as well as financial aid.

Interviews with union representatives indicated that among the craft unions, there is deep resistance to any further government involvement in the apprenticeship system, most probably because of the threat that unions may lose control over entry; industrial unions, on the other hand, were accepting of government involvement as long as the integrity of the wage structure was maintained.*

Implications and Recommendations

1. Central to any change in apprenticeship training must be active participation by government. Two main reasons support government assistance: 1) the cost of training currently is inappropriately distributed; 2) it is in the national interest to increase our stock of skilled manpower.

2. Employer participation in apprenticeship programs should be more widespread, and efforts should be made to involve employers who are not currently training apprentices.

3. Demonstration projects should be undertaken, based on European models. First in priority are pilot apprentice wage subsidy projects. This will have to happen outside of the construction industry, in all probability, because the building trades unions are opposed to it.

4. Money is not the only consideration in improving the American apprenticeship system. The Manpower Administration and the BAT, in concert with other government agencies, ought to establish a national technical assistance and research program using the British and German experience as models. The aim should be to develop more flexibility in apprenticeship training in particular, and vocation training in general.

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* An interesting sidelight here is the union report that when employers contribute money to joint industry training boards, they do not consider that the dollars are being expended for training, but rather, "as part of the collective bargaining package."

CHAPTER VI

IMPLICATIONS FOR ACTION

Felician F. Foltman

Diagnosis

If the apprenticeship system can be likened to a patient, following the medical analogy, we should ask, what is the prognosis? If the patient is ailing, will surgery be required? or massive transfusions? or will the wonder drug aspirin suffice? The doctors in this particular case, i.e., the scholars, researchers and administrators, are firmly of the opinion that the apprenticeship patient is basically quite healthy, but being a senior citizen, a few precautions and life style changes are recommended to insure a continuing healthy existence. No radical surgery is required at this time nor are massive infusions in order. In sum, all the diagnosticians agreed that apprenticeship training continues to be a valuable component of our total training system. All it needs is face-lifting, an adequate diet and tender loving care.

The conclusion that apprenticeship is not in mortal peril was reached as a result of the analysis of the research studies presented here and from a number of post-conference discussions with training experts. In his capacity as conference director, researcher and, as a member of the "New Initiatives in Apprenticeship" group the author was privileged to conduct many intensive discussions of the state of apprenticeship with union officials, state administrators of apprenticeship, business men and academicians all over the United States and Canada.

Our diagnosis suggests two useful ways for summarizing what needs to be done. First it is imperative that we understand the basic principles and functions of a healthy apprenticeship system. And once we are aware of these specifications we will be able to make realistic plans and recommendations to maintain its healthy state. To the first task, that of specification, we now turn.

Fundamental Principles Underlying a Model Apprenticeship System

A first requirement in specifying the details of a future oriented apprenticeship system is to avoid perpetuating inappropriate dogma. What may once have been soundly conceived or rooted in real needs may have outlived its period of usefulness. Just as bad, however, is the propensity to introduce change simply for its own sake. In this vein we turn our attention to the National Apprenticeship Act of 1937 for guidance concerning public policy. The act enables the U.S. Department of Labor to formulate and to promote the use of appropriate labor standards to safeguard the welfare of apprentices.

How was this objective to be achieved? What assumptions or principles were in the minds of the legislators? And how has the act been implemented over the past quarter of a century? From the practical experience gained in

conducting apprenticeship training and from research efforts we see the following principles undergirding this training system.

1) Voluntarism with Some Government Guidance

It is quite apparent that the most important principle is that apprenticeship programs are voluntary arrangements entered into by employers, unions, and individual apprentices. These parties have considerable autonomy to make what they see as appropriate decisions. Voluntarism has also meant that government inputs are confined to advice, technical expertise, provision of informational services, and since 1964, supervision and control of recruitment and selection. This latter activity results, of course, from our national resolve to set higher standards concerning discrimination in employment.

In contrast to our voluntaristic approach most European governments exercise a relatively high degree of direct control over apprenticeship. Thus, for example, the term of apprenticeship is terminated by government conducted or supervised examinations; tax benefits and other forms of financial subsidy are provided to employers; related instruction is not only recommended it is compulsory and; although labor and management are active participants in the process the training is regulated by detailed government devised rules and regulations. Does this imply that we should scrap the principle of voluntarism? Both academics and practitioners agree that we should not. There is always some support for increased governmental intervention no matter what the problem, but in the case of apprenticeship most experts agree that the process should properly be the responsibility of labor and management with government a friendly but active third partner.

2) Flexibility in Defining Standards and in Implementation

Distinctly related to the first principle is the concept of flexibility. If apprenticeship programs are to respond to the great variety of needs in our economy, they must be capable of adaptation. Numerous examples were cited in the discussions, suggesting that practially all of the apprenticeship standards laid down in 1937 are being applied too dogmatically and sometimes unproductively. Consider the term of apprenticeship, for example: must it be at least two years long? Indeed not, according to the U.S. Department of Labor Task Force report which recommended that apprenticeship be redefined to include occupations requiring only 2,000 hours (1 year) of on-the-job and tutorial learning experiences.

The need for flexibility is very evident in implementing standards for related instruction. A minimum of 144 hours per year of organized instruction is the recommended standard laid down by the Federal Committee on Apprenticeship in 1937. This standard assumed that an apprentice could and should attend classes two hours an evening, twice per week during a thirty-six week school year. While useful as a benchmark the standard has often been applied inflexibly. For one thing the standard is set in terms of serving time rather than specific achievement or performance. Further, two evenings per week is not the only alternative nor necessarily the best, as many apprentices and educators have testified. The guiding principle of flexibility is fortunately, being accepted even more as researchers and administrators experiment with training modules,

the use of achievement tests, dual enrollment in related instruction and in community colleges, released blocks of time, and other interesting variations in the delivery of related instruction.

It is clear that the concept of flexibility should be assigned high priority in every phase of apprenticeship. Several additional examples may help to make the point. Consider the skills to be acquired in on-the-job training; in some cases where it has been difficult for apprentices either to be exposed to a wide variety of skills required or even of the basic skills, some sponsors have provided for such skills training as part of related instruction. Similarly, preapprenticeship programs represent a flexible response to skill deficiencies. And, the creation of collectively bargained training funds is still another illustration of a flexible and innovative response to a particular problem. These funds are now a standard operating practice in much of the construction industry.

3) Broad Application to a Wide Range of Occupations and Industry

Combining practical on-the-job training with tutorial learning is and has been used almost universally. Although there is no denying the value of full time formal education in schools, it is equally true that apprenticeship training is uniquely suited for combining practice with theory. Given its usefulness, apprenticeship should be applied to a much broader range of occupations and industries than it now encompasses. Historically in the United States entire occupational groups have been excluded from approved programs. Among these are sales and retailing, managerial, clerical, professional and scientific occupations. In contrast, European countries define apprentice-ability much more broadly than we do.

A universalistic approach to apprenticeship means that upgrading and retraining are legitimate components of our total apprenticeship system. This need is particularly acute since so many persons presently employed as craftsmen have had less than complete training. Meanwhile the skills and knowledge required to cope with technological change are changing constantly.

Wider application of apprenticeship also should seek very specifically to persuade a broad range of employers who are not training apprentices to do so. Non-union employers should be encouraged to sponsor apprenticeship training, particularly in the home building sector. Application of apprenticeship to non-union employers might, coincidentally, dispel the current myth that apprenticeship training is the private prerogative of building trades unions.

4) Emphasis on Quality and Quantity

It is particularly urgent that all government officials who are associated with apprenticeship emphasize high quality training without de-emphasizing the number of apprentices in training. Too often in the past the only question asked has been, how many? Or are we training sufficient numbers to replace craftsmen who are about to retire? While these questions are of course very significant, exclusive concentration on them has often proved to be dysfunctional. Since apprenticeship training will never train all entrants into the ranks of skilled occupations (at least in the conceivable future) it would be in

the public interest for the relatively few who do use the system to receive topnotch training.

High quality training cannot be attained without effective instruction. What is required are dedicated teachers who are familiar with the subleties of instruction and with the technological developments in their industry. The apprenticeship system of the future must solve the problem of teacher training, not once but continually as new instructors are appointed.

And it goes without saying that no future scheme of apprenticeship will be responsive to labor market, employer, union, or personal needs unless and until it is firmly anchored to a solid data base, and in turn, to an imaginative research effort. Without carefully documented facts it is much too easy to perpetuate conventional, often misinformed wisdom.

In summary, the guiding principles for a model apprenticeship system that is effectively future oriented are: (1) non-compulsory or voluntaristic arrangements made by employers, unions and individuals with the help, encouragement and support of government, (2) flexibility in defining standards and in implementation, (3) broad applications to a wide range of occupations and industries, and (4) an emphasis on quality and quantity.

To be capable of producing desired outputs a system must be built on more than decision-making rules or principles, regardless of how well conceived these might be. A viable system needs a wide variety of resources, mechanisms, and processes for coordinating the parts into appropriate action. In less esoteric non systems terms we refer to such activity as administration. It is to administration of our model apprenticeship system that we now turn.

Recommendations Concerning Administration and Practice

Who pays for it? Who has access to it? And who runs the show? These are three key questions applicable to many institutions including, of course, a model apprenticeship system. We begin with costs and financing because it is true more often than not, that he who pays calls the tune.

1) Costs and Financing

Before deciding who should pay the bills there is the question of what exactly are the costs. From the perspective of the sponsor of training money must be provided for: supervision and administration of the program i.e., salaries and other expenses of training coordinators or other persons who have full time or part-time responsibility for organizing or controlling training; instructor salaries, tuition costs (including, at times, the wages of apprentices for time spent on related instruction); rents, supplies and materials; spoilage or wasted production materials - a consequence of using learners who are not yet properly skilled. From these costs a sponsor can subtract the profits resulting from production work in which apprentices are engaged at wages always lower (as much as fifty percent lower) than those paid to journeymen.

A certain ambivalence pervaded discussions of costs and financing. While many subscribed to the concept of autonomy for labor and management in conducting apprenticeship there were others who advocated training subsidies in one form or another. While it may be theoretically possible to achieve the best of all worlds by providing government financial subsidy without undue supervision or control, it may also prove to be an exercise in wishful thinking. What then are the options? Government could, of course, subsidize training or even go further by offering additional financial inducements to sponsors. At the other extreme, government could relegate all financial responsibility to the interested parties. Or government could take a middle position by making relatively modest investments for purposes of encouragement, registration, technical help and maintenance of equal opportunity standards.

While no one was prepared to recommend that government assume complete financial responsibility for apprenticeship, many recommended that government increase the magnitude of its investment.

There is general agreement that our future apprenticeship system will be more responsive to labor market and to social needs if some or all of the following changes in financing are adopted.

Recommendations

Expand the use of Apprenticeship Trust Funds. To encourage a further development of such funds it is recommended that the U.S. Department of Labor should maintain up to date information on existing funds, and furnish technical assistance in establishing new training trusts.

Develop practical schemes for providing tax credits or other forms of subsidy to apprenticeship sponsors. Why even consider training subsidies? The answer, of course, depends on who or what you are. Public officials who are interested in effecting a "quantum jump" in the number of apprentices or in the quality of training see tax credits or subsidies as the mechanism for achieving these goals. Employers are quite prepared to permit government to help them in underwriting training costs, providing always, that red tape is kept to a minimum. Not all trade unionists favor the idea. Construction unionists, in particular, are opposed to federal subsidies on the grounds that their industry had developed its own viable approach to funding. Academicians, on the other hand, endorse subsidization as a selective mechanism to deal with special problems. For example, it was felt that the homebuilding industry might be helped to develop its own permanent training institutions. Another special case deserving financial aid is the first part of the apprenticeship terms, about two years. It is during this period when the apprentice's productivity is marginal that employers could use financial assistance.

Provide More Financial Support for Pre-Apprenticeship Training. Pre-apprenticeship programs should be encouraged, but in particular a way must be found to provide at least some income support to persons during this training period. This is especially necessary for minorities who may otherwise be unable to participate in the training. Relatively short pre-apprenticeship programs of from six to eight weeks will not require huge

outlays of funds, but they will serve effectively to speed up the process through which craftsmen acquire productive skills.

Increase the amount of financial support for outreach and journeymen retraining. To improve the quality of training and to add to the nation's stock of skilled human resources it would be in the public interest to provide additional financial assistance to attract (outreach) qualified minority members into the ranks of journeymen. Such programs are already established and have already tested out successful approaches. Not so well established but extremely desirable are programs to update and to upgrade journeymen skills. Enthusiasm for upgrading is high among journeymen, their employers, and their union officials. Additional investments in this phase of our skill training system are bound to result in many positive dividends.

Expand amount of subsidy for related instruction. If truly skilled persons are what we want to obtain from our apprenticeship system it is imperative that financial assistance for related instruction be increased. Otherwise our journeymen will always lack a real understanding of why and how things work. Up to now some public funds have been available to pay some instructional costs when related instruction is offered in public vocational schools. But more funds are required so that all apprentices can receive up to date related theory from competent instructors, in modern facilities, at times when they are not exhausted and suitably integrated with their on-the-job learning experiences.

Budget more Federal dollars for Sound Administration. One of the ways to free Federal Bureau of Apprenticeship and Training officials is to subsidize some or all of the work of state apprenticeship council. This specific suggestion was approved in principle by the Apprenticeship Task Force as an idea that merits not only study but also field testing. Another and potentially very significant suggestion was advanced by one of the researchers who recommended that financial assistance be offered only to properly registered programs. Apart from these two specifics there can be no question that for the public interest in apprenticeship to be realized more monies need to be made available for every facet of administration.

2) Ways and Means for Improving Quality of Training

The case has already been established that greater financial investments should be made in our system of apprenticeship. Not that infusions of money can solve all problems. Nevertheless even relatively small increments of money could help to bring about important qualitative improvements. The wisest course is to plan and to budget the required changes and resources that need to be allocated. What follows here is a series of recommendations indicating the types of constructive changes that are required. They are distilled from research projects or from the practical experience of trainers and administrators. Most of them can be implemented immediately by responsible officials in organized labor, by employers, by JAC's or by educational administrators. In a few cases action is required.

No attempt is made here to rank the recommendations in order of their importance. Any or all would serve to improve the total training system. Instead they are simply dichotomized into two sets with the first set representing potential actions that can be initiated immediately by the interested parties. The second set involve government executive or legislative decision.

Recommendations

Training Content and Sequence of On-The-Job Training and Related Instruction should be based on an Analysis of Required Performance. For maximum efficiency apprentice training programs should be developed from clearly stated performance objectives based on carefully conducted task analyses of work to be performed. The emphasis should be on specific demonstrated performance rather than on clock hours spent in a course. After a program of research and analysis new and up to date standards and criteria for on-the-job and related instruction should be promulgated. These standards, in turn, must permit some variations in actual practice so that the training can be adjusted to slow and to fast learners. New standards should recognize also the need to base the total length of the training term on criteria developed through rational task analysis and not simply on labor market predictions.

Incorporate More Tests and Examinations with the Training Process. Carefully validated tests and examinations can be used throughout the process For example, not all apprenticeship programs culminate in a final definitive examination. But if candidates seeking journeymen status were required to successfully complete a rigorous two or three day exam, partially written but also including motor skills or real tasks, administered by international union or joint employer-union bodies, the value of the training would immediately be enhanced. Similarly, decisions about advanced placement of apprentices (i.e. credit for previous schooling or experience), and their progress through a training program should be based on results obtained when taking valid and reliable performance tests. Judicious testing, which must always be consistent with our equal employment standards, would also permit sponsors to develop appropriate training sequences for slow and for fast learners.

All apprentices should continue to be required to complete a specified amount of related instruction but implementation of this standard should be based on flexible and modern training technologies. It may be desirable in some circumstances to develop a curriculum for related instruction in subjects common to a number of occupations - a so-called common core curriculum. With or without a common core concept the related academic instruction should be moduled into independent units which would permit greatest instructional flexibility. Experiments with television casettes and live television indicate that this technology offers considerable potential for training particularly for those in remote areas. And whatever the form or content of related instruction public schools (primarily but not exclusively vocational education) and collegiate level institutions can play expanded roles in this side of the training process. In this latter connection there is considerable enthusiasm and support for the arrangement whereby apprentices receive related instruction from a college

(usually a community college) thus simultaneously fulfilling a requirement and receiving academic credit towards a degree. Whatever the content and wherever provided there is no reason, according to the experts, to force all apprentices into the two hours in the evening twice per week pattern. Full time blocks interspersed throughout the apprenticeship term or a full day every second week or any number of newer arrangements would not only improve efficiency of timing, but serve to remove an unnecessarily onerous feature over which thousands of apprentices have complained. Clearly, however, it is labor and management which must first decide what is appropriate for individual apprenticeship programs, after which training technology and facility are selected.

More and Better Supervision of the Training is Required. There is more unanimity on this point than on any other. A whole array of changes could be made at relatively little cost but with great potential benefit. Consider, for example: apprentices should be rotated so as to learn all aspects of their occupation; if it is impossible to learn specialized skills on-the-job, redesign the training so that skills can be learned off-the-job in a variety of schools; on-the-job experiences will be reinforced if coordinated with related instruction, or at a minimum discussed during related instruction; journeymen are probably the best single source of qualified instructors but without help in preparing materials and in instructing they are apt to flounder at best. And in a slightly different vein immediate consideration should be given to establishing appeals mechanisms or due process procedures where they now do not exist so that apprentices have an effective voice in decisions made involving their welfare. As already indicated in our discussion of financing a quantum leap towards better supervision of apprenticeship training can be made by appointing qualified persons to perform such duties on a full time basis.

Recommendations with Implications for Government

More and Better Data are Required. The Federal Bureau of Apprentice and Training is actively seeking to automate its record keeping system. These efforts are encouraging. Even more needs to be accomplished, particularly in regard to establishing a more uniform system of data relating to the training process, not just accessions, dropouts or completions.

Technical Assistance and Research Must be Expanded. Technical assistance is a standard part of the mission of governmental apprenticeship agencies. Such assistance may be, at one extreme, simply providing more information about apprenticeship training to minority communities, to guidance personnel, to youth and to others. At more sophisticated levels technical assistance means providing apprenticeship sponsors with help or any and all facets of the process. Such assistance must be based, however, on the results of research and experimentation rather than on obsolete dogma or myth. The Federal government must continue to support and even to expand its long range research program now being conducted with the U.S. Department of Labor. Among many valuable research ideas strong endorsement from all quarters is given to experimental and demonstration projects. Underlying this endorsement is the need to try out and to experiment with changes in the training process. How to finance apprenticeship, whether or how community colleges can offer acceptable related instruction programs,

whether television technology is acceptable to apprentices and, a host of similar questions are best answered by actual trial or demonstration, not only on the basis of formal research. Both exploratory and applied research projects are vital if we are to keep pace with technological and other fast moving developments.

3) Apprenticeship and Minorities

The need to sustain continuous and rigorous enforcement of anti-discrimination policy cannot seriously be questioned, although, unfortunately it sometimes still is. Much has been accomplished but the job cannot be considered to have been completed, as is evident in the discussions summarized in this document. And as befits an issue as important as equality of opportunity most of the recommendations in this realm require active intervention by governments with real cooperation also of the interested parties.

Recommendations

Outreach Staffs and the Office of Federal Contract Compliance and other responsible government bodies should continue to expand apprenticeship opportunities for Minorities. This general recommendation was qualified to cover three different sets of circumstances:

(1) Assuming "no change" in the resistance to minorities in the unionized sector of the construction industry, it is recommended that:

a. Governments implement, actively, forcefully and continuously, anti-discrimination legislation.

b. Attempts should be made to use other routes of entry, in addition to apprenticeship, for minorities.

c. Minority man-hour goals should be replaced with an enforceable "retention quotient," with the number of new minority union members as the ultimate criterion of success.

Under this reality, Outreach staffs would operate much as they do now.

(2) Assuming "marginal change," it is recommended that:

a. Strong support system be erected for apprentices, combining the energies and talents of all personnel associated with the apprenticeship system - shop stewards, job supervisors, business agents, journeymen, related classroom instructors, plus Outreach staffs - to identify and act on individual and group problems related to the work environment, and to find journeymen who can assist in minimizing them. Increased effort should be made to broaden orientation programs for apprentices so that they may become acquainted with the customs and traditions of the union, in particular, and the industry in general.

b. Outreach staffs should act as advocates for apprentices in such matters as improving technical assistance on-the-job, job placement, improvement of on site working conditions. In addition, Outreach should make a concerted effort to bring back into training programs apprentices who have dropped out. These added responsibilities probably will necessitate augmenting present Outreach staffs.

(3) Assuming "ideal change," i.e., maximum attempts are made by unions, management and Outreach staffs to place, train and retain all apprentices, it is recommended that:

a. Low beginning wage levels should be increased for all apprentices.

b. The training process should be revised and revamped to allow for: greater flexibility (accelerated training, self-pacing, steps in skill recognition which would allow entry at various stages of apprenticeship, broader preparation to include related skills): more modern training techniques; better coordination between related classroom instruction and on-the-job training.

The Office of Contract Compliance must undertake better enforcement and monitoring of affirmative action plans. Voluntary plans with no effective enforcement arrangements have proved to be almost meaningless. Enforcement, however, should be coupled with constructive assistance including the communication of exactly what does or does not constitute compliance.

<u>High Priority Should be given to Research Relating to Minorities in Apprenticeship</u>. Research and demonstration projects should be developed with respect to minority selection procedures. The need here is to improve retention rates and in order to do this we need to understand what are the real incentives and disincentives in this situation. Particularly lacking are longitudinal studies of recruitment and retention of minorities in unionized and non-unionized sectors.

Special initiatives are required to expand the use of apprenticeship training for women. Specific applied research projects should be undertaken such as the following:

1. Design and undertake a professional survey of high school students, high school teachers and counselors, to uncover gaps in information, or misinformation about labor market limitations and opportunities for women. These data should be used to design a course curriculum for use throughout the public school systems nationally.

2. Undertake a systematic review of the office and program procedures of public and private agencies and institutions charged with the delivery of job market information and services, to correct sex biases in written material and in direct personal contacts with clients.

3. A promotional campaign, undertaken by the Department of Labor, to promote industry-wide solutions to correct discriminatory contract

language and to discourage discriminatory contract interpretation.

4. Seek to institute "career ladders" in the health and other fields, which have a high female worker population, to provide upward mobility. One method would be to require medical facilities receiving state, county, municipal or federal funds to institute training programs.

5. Provide opportunities for female inmates of correctional institutions to participate in apprenticeship or other skill training programs during their incarceration.

4) Data Requirements for Developing Model Training Systems

A reminder is in order, from time to time, that apprenticeship not only is a training process, but it is also a manpower planning mechanism whereby unions and employers in some industries (notably construction) attempt to balance the supply of skilled labor with demands for it within local labor markets. Here as elsewhere in apprenticeship training, conventional wisdom is often misleading because it is premised on inadequate information. To suggest, as some do, that apprenticeship training should be mandatory is to be slightly out of touch with reality. Declining technologies within an industry, plastering for example in building, need few if any new apprentices in a situation where qualified journeymen are largely unemployed. In more typical situations it is frequently suggested that trade unions restrict the numbers of members in a given local by training very few apprentices in order to raise the wage rates and to exercise tight control in a labor market. This view too is somewhat simplistic. Construction industry unions are interested in keeping all of the members working and simultaneously responding to employer demands for trained persons. If trained people are not available from the union employers will turn to other sources--non-union sources or other unions. Neither of these latter circumstances is acceptable to a functioning union. What is required to solve these planning problems is a modern, probably computerized, manpower information system.

Considerable progress has been made in defining the scope and capabilities required for an effective computerized manpower information system, according to several researchers. Such ability to specify requirements of manpower information systems is derived from empirical studies of local labor markets, of actual employer and union practices. And these studies, in turn are ever more productive because of the growing banks of computerized data being accumulated by the government in various programs (for example, the Construction Industry Stabilization Committee is storing accurate wages and fringes information by trade and by union in the construction industry). The pilot study of industry training practices, conducted by the Bureau of Labor Statistics, reported steady progress towards solution of long standing deficiencies, namely, our lack of valid information about the scope, magnitude and characteristics of the industrial training system. Clearly, the times are ripe for accelerating the movement towards more valid and reliable information to support a model training system.

Recommendations

Experiments to computerize local labor market information systems in the construction industry should be financed and supported by the Federal Government. Only the lack of timely and accurate information prevents us from devising rational plans for matching employer needs, local union needs, and public interests. Not the least of the benefits of this continued thrust would be to dispel some of the mythology surrounding the training and referral processes that are practiced in the construction industry.

The Bureau of Labor Statistics effort to develop an efficient system for collecting information about training systems should be strongly supported. With relatively small amounts of money it will be possible to obtain information about employer training practices which have never been accumulated. In a country that boasts of the world's best manpower statistical system this gap in our data can no longer be tolerated.

Other Required Action

The model apprenticeship training system that is delineated in this analysis can become a reality providing that employers, unionists, educators and public officials all work to that end. Although apprenticeship training programs are mankind's oldest training system they can be improved, as these research reports testify. Research on every facet of apprenticeship can and should continue with the highest priority assigned to projects that explore new and flexible approaches for helping apprentices to obtain required skills and knowledge. And research on financing can be said to be equally important. But research, per se, will not build a model training system, distasteful as this thoutht may be to academicians. In a similar vein, we would argue that there is no pressing need to "pass a law," as tempting as that solution is to many. What is required instead is continued research, controlled experimentation and active cooperation of public and private interests all participating in a reshaping of this training process.

Required action and research steps for these responsible parties are listed throughout this report. Progress toward the achievement of a model system should not be forced, however. For example, a very persuasive case is made by many that apprenticeship should be performance based rather than on a specific number of years. Such performance based training developed by thorough task analysis is viewed as appropriate in some industrial or factory contexts. On the other hand, it is anathema to others, such as segments of the construction industry. A flexible training system can accommodate both views without compromising efficiency or other values. There is no necessity for a single monolithic approach.

Contributions can be made by many. Sponsors do not have to await government approval, for example, to negotiate innovations in related instruction delivery, as experiments with community colleges amply illustrate. Neither is a government imprimatur required for an apprenticeship sponsor to analyze actual job requirements in an attempt to develop realistic training sequences. Moreover, there are

no insurmountable obstacles interposed by collective bargaining to the introduction of constructive changes in how apprenticeship is conducted. Witness the rapid growth of apprenticeship training funds as an illustration of the creative potential of the process.

None of this is meant to suggest that government should not have an effective voice in apprenticeship. Clearly, a policy of benign neglect at this point in time is unrealistic. There must continue to be: forceful implementation of anti-discimination standards; aggressive pursuit of reliable and valid information; continued experimentation with the use of financial subsidies in special cases; and active support of a comprehensive research program. In sum, as the "New Initiatives" task force correctly asserted, government must assume an active leadership role in the conduct of apprenticeship affairs. It is, of course, the national government that must point the way to a model apprenticeship system by conducting systematic reviews of existing standards and procedures, by analyzing training needs in industry rather than by simply pontificating, and by providing specific technical service and leadership based on expertise. If we are to achieve our model apprenticeship system the government role must be sharply different from the current rather passive approach of bookkeeping (registration) and salesmanship.

And finally, if ever there was a right time to restructure apprenticeship, that time is now. There is, first of all, a continuing need to train skilled craftsmen. On this essential point both industry and labor agree. While there are differences, from time to time, concerning how many skilled craftsmen are required or precisely how the training should be conducted, both parties realize that essential skills are learned best by apprenticeship training. But in addition there is a concatenation of forces from other quarters proposing provocative reforms involving education and training. Serious scholars are suggesting that perhaps there should be closer links between schools and the workplace. There is a realization that schools have not really equipped youth with adequate work skills or work values. Among the reforms suggested is a return to an apprenticeshiplike system combining school work and job experience tailored to individual human development needs. Whatever the motivation of the social reformers, whether directed at youth unemployment, alienation from work, or the presumed inability of our schools to solve all problems, they turn ever more frequently to apprenticeship arrangements as an effective solution for our difficulties. Although one should counsel moderation one can also hope, with the reformers, that the inherent flexibility of a model apprenticeship system will be able to successfully cope with these new challenges.

The specifications are clear for a model apprenticeship system, the times and circumstances are propitious, all that is required is the will to act.